American Journal of Public Health
and THE NATION'S HEALTH

Volume 41 August, 1951 Number 8

A Mortality Index for Use in Place of the Age-Adjusted Death Rate*

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THE purpose of this paper is to show that the age-adjusted rate, as presently employed, is inadequate for mortality comparisons of different groups; to determine the reasons for the inadequacy; and to construct a new index as a substitute for the age-adjusted rate.

Because the above statements have far-reaching implications, it is imperative to review the voluminous and interesting literature on the subject. Fortunately, this task was performed in a masterly fashion by Theodore D. Woolsey in a chapter titled "Adjusted Death Rates and Other Indices of Mortality" which was published in *Vital Statistics Rates in the United States, 1900–1940*.[1] Woolsey presents not only a description of the different methods of adjustment, but provides also a comprehensive discussion of the literature and points up the main issues encountered in evaluating the different indices. In addition, committees of the Statistics Section of this Association, under the chairmanship of A. W. Hedrich, dealt with a number of phases of the problem and prepared several lucid and comprehensive reports.[2-4] It is therefore unnecessary to duplicate these excellent publications, but rather to utilize them as background for the present report.

It is desirable, however, to repeat two fundamental notions which emerge from the many discussions on the subject:

1. The age-adjusted rate has no inherent value in itself. The actual numerical value of the rate has no absolute meaning. It is not designed to measure the mortality risk of a group. Its purpose is to render different groups more comparable in order that their relative mortalities can be evaluated.
2. The age-adjusted rate is not a substitute for the age-specific rates. A complete and satisfactory comparison of mortality between two groups can be obtained only by a detailed study of the age-specific rates. This thought is paramount in nearly all the discussions on the subject. However, there appears to be a definite need for a single figure which summarizes the pertinent comparisons contained in two sets of age-specific rates. As Greenwood very aptly put it, "The numerical statistical method, as distinct from the tabular statistical method of our ancestors, has been introduced precisely because the power of the human mind to grasp a number of particulars is limi-

* Presented at a Joint Session of the American Association of Registration Executives and the Statistics Section of the American Public Health Association, at the Seventy-eighth Annual Meeting in St. Louis, Mo., November 2, 1950.

ited. . . . It was not until the 17th century that it was realized that in seeking to grasp everything, one tended to grasp nothing."[5] In addition, there is a practical need for a single figure which summarizes the age-specific rates for use in routine public health activities. Such a need was expressed by a committee of this association as follows: ". . .The problem is to suggest as substitutes for the crude death rates the simplest practicable rates, such as might be used by a health officer who is asked at a meeting how the city death rate compares with the rural, or whether it is true that mortality in the state is rising."[4]

It is realized that whatever index is to be used for the purpose, much of the detail available in the age-specific rates will of necessity be lost, and often the index comparison will have to be supplemented by a more detailed study of the rates, age for age. The function of the age-adjusted rate must therefore be viewed as a device which, through an averaging process, presents in a single figure the pertinent information in a set of age-specific rates, in order that it may be compared with a similar figure obtained from another set of age-specific rates.

If this be the function of the age-adjusted rate, then it is necessary to determine what type of information is usually looked for in a detailed comparison of death rates, age for age, and to judge the different methods of adjustment on the basis of how closely they approach the detailed comparison. The pertinent question is whether, in a comparison of two sets of age-specific rates, attention is generally focused on *absolute* or on *relative* differences between the individual rates. In other words, is it likely that a drop of one unit, from 50 to 49, in infant mortality assumes the same importance as a drop of one unit, from 2 to 1, at age 20,* or is it more likely that the level of the rate is a basic element in the comparison? The answer depends on the use that is likely to be made of the comparison.

In general, it may be stated that when the purpose of the analysis is to provide measures such that the absolute value of each is meaningful in itself, then the number of deaths, and therefore the absolute differences in the rates, are the more important. However, when the analysis is for purposes of comparing different risks, the actual numerical values of the resulting index are meaningless, and attention is directed primarily to relative differences. For example, the use made of age-specific rates in life table construction is to derive certain functions such as "expectation of life" which are meaningful in themselves. Moreover, the meaning inherent in these functions is derived from a summarization of absolute numbers of deaths and years of life lived. But when two sets of age-specific rates are viewed for the purpose of comparing the forces of mortality exhibited in them, the relative risks at each age are of more importance, and attention is generally focused on proportionate differences between the individual rates.

CRITERIA FOR AGE-ADJUSTED RATES

The desirable characteristics which an age-adjusted rate should possess have been discussed by a number of writers on the subject from several points of view. In all cases, however, the age-adjusted rate was required to satisfy only very mild conditions. In addition to such obviously desirable qualities as would be required of any average, the main criteria may be summarized as follows:

1. That the age-adjusted rates for two groups having the same age-specific rates be identical.
2. If each of the age-specific rates in community A is higher than the corresponding one in

* In this, and throughout this paper, it is assumed that the rates are based on very large population groups and that the differences are therefore real. The problem of reliability and standard error is not dealt with in this discussion.

community B by a constant proportion, then the age-adjusted rate for A should be higher than that of B by the same proportion.

These requirements are satisfied for nearly all methods of adjustment proposed, irrespective of the specific standard population employed. It may, however, be just to inquire whether these conditions are adequate for the purpose. They no doubt are necessary conditions, but are they sufficient? It must be realized first that the requirements are artificial and unrealistic. It would be rare indeed to find two communities in which the age-specific rates for one bear a constant relationship to those of the other throughout the entire life span. More often, the age-specific rates differ in two communities by variable proportions and the differences are not always in the same direction.

If the age-adjusted rate is to serve as an index which summarizes adequately the set of age-specific rates, it must satisfy much stronger conditions. If it is to be used as a yardstick for comparison it should satisfy the elementary requirements of any measure—namely, that it be both *specific* and *sensitive*. It is not sufficient that certain relationships present in the age-specific rates be reflected in the age-adjusted rates, but the reverse must also be true—the information obtained from the index needs to be confirmed by the age-specific rates.

In other words, if the index is higher for one community than for the other, the same situation must exist in the two sets of age-specific rates. This obviously does not mean that each of the age-specific rates in one community must be higher than the corresponding one in the other, but it must be true from an overall summarization point of view. Moreover, there must be a reasonable numerical relationship between the relative values of two index numbers and the two sets of age-specific rates from which they were constructed. If the index for one community is higher by p per cent than that for another, then it should reflect the fact that the age-specific rates in the first community are higher by p per cent than those in the other. Again, this need not be true for each age-specific rate but it must be true in a statistical sense when evaluated according to predetermined criteria.

None of the methods of adjustment in common use, irrespective of the specific standard population used, satisfies these elementary requirements. The main limitation, as will be shown later, is that they evaluate differently similar relative changes in the age-specific rate, depending on the position of the rates in the age scale.

RELATIVE RISKS AT DIFFERENT AGE LEVELS

The following simple illustration shows that the present method of adjustment evaluates differently equal relative changes if they occur at different parts of the age scale. The age-adjusted rate for white males in Alabama according to the direct method of adjustment and the use of the 1940 U. S. population as a standard was 11.8. If, in 1941, the age-specific rates for every age group were identical with those of the preceeding year but the rate for ages 15–24 was reduced by 50 per cent, the effect would have been to reduce the age-adjusted rate from 11.8 to 11.6. However, if the 50 per cent reduction had occurred in the age group 55–64 instead of 15–24, the resultant reduction in the age-adjusted rate would have been from 11.8 to 10.8. Similar discrepancies would result if comparisons were made by any other method of age adjustment or by the use of different standard populations. Nearly all methods have the common characteristic that they put very heavy penalties on increased rates when they occur at the tail end of the life span as compared with proportionate increases in the pro-

TABLE 1

Per Cent Increase in Age-Adjusted Rates Resulting from a 50 Per cent Increase in Age-Specific Rates: Total Population, United States, 1940

Method of Adjustment and Standard Used	*Per Cent Increase in Age-Adjusted Rate Caused by a 50 Per Cent Increase in Specific Rate, for Ages—*										
	Under 1	*1–4*	*5–14*	*15–24*	*25–34*	*35–44*	*45–54*	*55–64*	*65–74*	*75–84*	*85+*
Direct method and Indirect Method:											
U. S., 1940	4.7	0.9	0.9	1.9	2.8	3.7	6.5	8.4	11.2	9.3	3.7
England and Wales, 1901	7.9	2.2	1.1	2.2	3.4	3.4	5.6	7.9	9.0	7.9	2.2
Equivalent Average Death Rate (to age 65):											
U. S., 1940—Specific Death Rates	5.4	1.2	1.0	2.0	3.1	5.1	10.4	22.0	—	—	—
Relative Mortality Index											
U. S. 1940—Deaths	0.8	3.2	8.5	9.1	8.1	7.0	5.9	4.0	2.4	0.9	0.1

ductive periods of life. Conversely, lower rates in the older ages reduce the age-adjusted rate by a greater margin than proportionate lower rates in the younger ages.

This unequal evaluation of relative changes at different age levels is demonstrated in Table 1 for several methods of adjustment. It was constructed to show the effect on the age-adjusted rate which results from a 50 per cent increase in the rate for the different age groups. It will be seen that all methods of adjustment but one show a much larger increase in the age-adjusted rate when the 50 per cent increase occurred either in infancy or in old age than when it happened in early adulthood and the middle range of life. The single exception is for the Relative Mortality Index, for which the reverse is true. The figures for under 1 year and for ages 1–4 are gross underestimates, because in these cases the 50 per cent increases relate to a single year and to 4 years respectively, while for each of the other age groups the 50 per cent rise operates for 10 years.

Figure 1 illustrates this unequal weighting for the direct method of adjustment using the 1940 U. S. total population as a standard. Thus, when the 50 per cent increase is in age group 5–14, the resultant increase in the age-adjusted rate is less than 1 per cent, while if it is at ages 65–74, the age-adjusted rate rises by over 11 per cent.

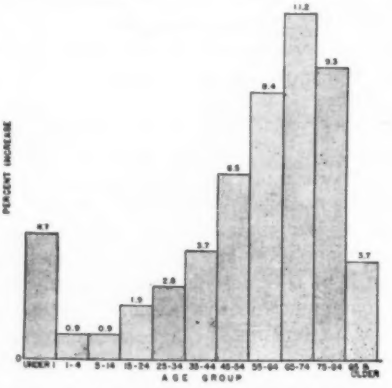

FIGURE 1—Percentage increase in the age-adjusted rate which results from a 50 per cent increase in the different age-specific rates. (Direct method of age adjustment, standard U. S. total population, 1940.)

One might question the wisdom of allowing the index to assign such heavy weights to the period of old age. Some might argue, as Derrick did, that "the importance of identifying one death at 20 might be many times as great as a similar one at 65, for the one ought not to have occurred whereas at 65 we are approaching the region of inevitability,"[5] and consequently they may prefer to reverse the procedure and assign greater weights to the younger

ages. Either of these involves judgment and a degree of arbitrariness which dulls the specificity and sensitivity of the index.

It would appear that the index could best serve its purpose of providing in summary form a comparison of age-specific rates if it were freed from the burden of prejudging the relative importance of mortality at different ages but would assign equal weight to equal proportionate changes in the risk of dying at each year of age in the entire life span.

Consider two states which have identical rates in all but two of the age groups, but at ages 15–24 the rate is 50 per cent higher in state A, and at ages 55–64 the rate is 50 per cent higher in state B. What should the relative values of a satisfactory index be? Nearly all present methods will show the age-adjusted rate for B higher than that for A; yet both intuition and logic compel the conclusion that community B is no worse off than community A. In fact, some might feel that state B should be given the more favorable rate. A more rational approach would be to impose on the index the single task of summarizing the age-specific rates as they stand, and to require it to assign identical ratings to the two states.

It has been stated by some that a desirable index should satisfy the requirement that two communities with identical per cent distributions of population at specific ages and the same crude death rates should also have the same index of mortality. The direct method of adjustment does not satisfy this requirement, but it may be questioned whether this is a desirable characteristic for the index to possess. Consider groups A and B which are identical in their age composition. In A, the rates for the *30* year age period 15–44 are lower by 10 per cent than those of B. But B could have the same crude rate as A if during the *20* year age period 45–64 it had rates which were lower by only 5 per cent than those in A. Should the index give equal ratings to the two groups, or is it more reasonable to say that B can make up its deficit either by having a 10 per cent lower rate for an equally long span of life, namely 30 years, or by having rates which are lower by 15 per cent for a period of 20 years in the life span? If the index is to summarize the different risks it should produce ratings which are more in conformity with the latter than the former.

EXAMPLES OF LACK OF SPECIFICITY AND SENSITIVITY OF THE AGE-ADJUSTED RATE

It may be desirable to view several examples encountered in actual practice in order to evaluate better the lack of specificity and sensitivity of the age-adjusted rate which results from the unequal weighting of relative changes in the age-specific rates.

Consider the simpler situation where the rates in one group are consistently lower than those in another group, such, for example, as is revealed by comparing the mortality for white males in the United States in 1940 and 1920. The age-specific rates for the two periods and the per cents by which the rates for 1940 were lower than those for 1920 are shown in Table *2* and are illustrated in Figure *2*.

The question for which an answer is sought is what per cent reduction in mortality has occurred in the 20 year period, or as Yule put it, we look for "an average which will measure in summary form the general fall in mortality." [5] By the use of the age-adjusted rate direct method as the measuring rod, and the 1940 U. S. population as the standard, the answer is 19 per cent. Does this figure of 19 per cent portray adequately the reduction that has occurred, and does it summarize the data reflected in the age-specific rates?

When the percentage reductions in the individual age-specific rates are

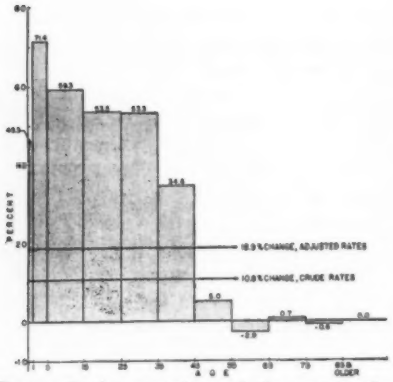

FIGURE 2—A comparison of the age-specific rates for white males 1940 and 1920. The per cent by which the rates for 1940 were lower than those for 1920.

TABLE 2

A Comparison of the Age-Specific Death Rates and the Age-Adjusted Rates by the Direct Method for White Males in the United States 1920 and 1940

Age Group	*Age-Specific Rates Per 100,000 United States*		*Per Cent Difference 1940*
	1920	*1940*	*1920*
Under 1	103.7	56.7	—45.3
1– 4	9.8	2.8	—71.4
5–14	2.7	1.1	—59.3
15–24	4.3	2.0	—53.5
25–34	6.0	2.8	—53.3
35–44	7.8	5.1	—34.6
45–54	12.0	11.4	— 5.0
55–64	24.5	25.2	+ 2.9
65–74	54.4	54.0	— 0.7
75–84	121.5	122.2	+ 0.6
85 and over	249.2	249.3	— 0.0
Crude Rate	13.0	11.6	—10.8
Age-Adjusted Rate			
U. S., 1940	14.3	11.6	—18.9
E and W, 1901	12.9	9.5	—26.4

viewed, the very impressive picture is revealed that during the long period from birth to age 45 the per cent reductions were far above 19; they ranged from 35 to 71 per cent. But at the later ages the reductions were relatively small and in some age groups there has been a slight increase. However, these small reductions in the older ages were sufficient to outweigh the extraordinary progress portrayed in the age-specific rates for the younger ages. While the age-adjusted rate in this case may be considered to be specific in that it shows that the rate for 1940 was lower than that for 1920, it may not be sufficiently sensitive in that it may lack the ability to reveal adequately by ***how much*** the rate for 1940 was lower than that for 1920.

The more usual comparisons are more complicated than the above in that it is not often that the age-specific rates for one group are consistently higher or lower than those for another group. The more common comparison involves two groups in which the rates for one are higher at certain ages and lower at other ages than those for the other. In a review of the age-specific rates for sets of two among the 48 states, the pattern most often encountered was the following: State A has higher rates than state B over a relatively long band of the life span, for example, throughout childhood and middle age; then after a certain age a switch occurs and the rates for state B are higher than those for state A.*

With present methods of adjustment the states in which the lower rates are in the older ages will generally have lower age-adjusted rates. Moreover, in these situations the standard population used will have considerable effect on the final comparison.

As an illustration, consider the states of Louisiana and New Mexico. The age-specific rates for white males in these states for 1940 present the following

* That this is a very common occurrence might be seen from the following general consideration: When the four quartiles are determined for the age-specific rates in the 48 states for each age group, it is found that no single state had all its 11 age-specific rates in one quartile, only 5 were represented in two quartiles only, and more than one-half the states had rates in all four quartiles. Even if a stronger requirement is made, namely, not to count any quartile in which the state is represented by only a single age-specific rate (that is, if a state is considered to have rates in a given quartile, it must have two or more of its age-specific rates in that quartile), there are only three states which had all their rates in one quartile and more than half of them had rates in at least three quartiles (see Table 3). It is therefore obvious that in state-to-state comparisons, the two sets of age-specific rates would present rather complicated situations, with several of the age-specific rates being higher for one state than for the other, while for another number of the rates the reverse is true.

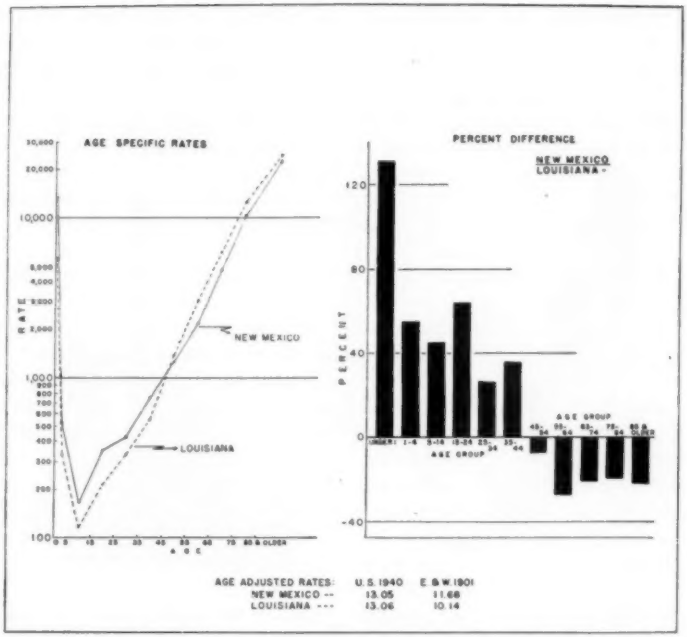

FIGURE 3—A comparison of the age-specific rates for white males in Louisiana and New Mexico 1940, and the per cent difference in the rates for New Mexico to those of Louisiana.

TABLE 3

Distribution of the 48 States According to the Number of Quartiles in Which Their Age-Specific Rates Fell; United States, 1940

Number of Quartiles	Number of States Having Age-Specific Rates in the Specified Number of Quartiles: Including cases when only a single rate is represented in a quartile	Under the requirement that at least 2 of the age-specific rates be in a given quartile
1	0	3
2	5	19
3	17	21
4	26	5
Total	48	48

situation: The rates are consistently higher for New Mexico up to age 45, but from that age on until the end of the life span a complete reversal takes place and the rates for New Mexico are consistently lower than those for Louisiana (see Table 4 and Figure 3). When the rates for these states are adjusted with the use of the 1940 U. S. population, almost identical rates are obtained—13.06 for Louisiana and 13.05 for New Mexico. However, if the 1901 population of England and Wales is

TABLE 4

A Comparison of the Age-Specific Death Rates and the Age-Adjusted Rates by the Direct Method for White Males in Louisiana and New Mexico, 1940

Age Group	Age-Specific Rates per 100,000: Louisiana	New Mexico	Per cent Difference New Mexico Louisiana
Under 1	5693.1	13146.8	+ 130.92
1 – 4	333.3	518.1	+ 55.45
5 –14	112.4	163.0	+ 45.02
15–24	217.8	356.7	+ 63.77
25–34	338.7	428.1	+ 26.40
35–44	550.4	751.5	+ 36.54
45–54	1389.8	1289.1	— 7.25
55–64	3029.3	2200.9	— 27.35
65–74	6048.1	4796.5	— 20.69
75–84	12602.6	10196.5	— 19.09
85 and over	28959.7	22633.7	— 21.84
Crude Rate	1059.7	1203.1	+ 13.53
Age-Adjusted Rate			
U. S., 1940	13.06	13.05	— 0.1
E and W, 1901	10.14	11.68	+ 15.2

used as the standard, the age-adjusted rates are 10.14 for Louisiana and 11.68 for New Mexico, a difference of 15.2 per cent. It is seen that not only is the age-adjusted rate deficient in its sensitivity, but its specificity is also in question since, by the use of different standards, different results are obtained for the relative standing of the two states. Moreover, no objective yardstick is available for determining which of these, if any, summarizes more adequately the complicated situation inherent in the two sets of age-specific rates.

The dilemma resulting from situations such as this may be viewed from several points of view. Probably the most sensible is that the two states exhibit such different patterns of mortality that they cannot be compared by a single measure; the comparison between these states can only be accomplished by a very detailed study of the specific rates, age for age. However, if this point of view is adopted, then the logical conclusion is to drop completely the use of age-adjusted rates because, as was pointed out several times, the pattern of the age-specific rates for these states is not the exception but is more nearly the mode. Moreover, as was noted previously, there exists a real need for a single index for use in comparing group mortalities.

Another approach is an attempt to determine which of the comparisons provided by the different standards is more desirable. This inevitably leads to a prejudgment on the relative importance of death in the different parts of the age scale. It is unlikely that different investigators will arrive at similar evaluations, and the measure, of necessity, will degenerate into a reflection of the likes and dislikes of the evaluaters.

A third approach is to question, not so much the differing results obtained by the different standards, but to inquire into the entire mechanism of age adjustment to determine whether or not it accomplishes what it was presumably designed to do. In other words, is the procedure of selecting an arbitrary population merely because it is or was a living population likely to produce sensible comparisons between two sets of age-specific rates? This last approach deserves further exploration.

RELATIVE RISKS AND ABSOLUTE NUMBERS OF DEATHS

The dilemmas and paradoxes revealed by the foregoing examples result mainly from the fact that while the age-adjusted rate is generally interpreted as an instrument for comparing relative risks, its actual value is dominated by *absolute number* of deaths. It evaluates the age-specific rates in terms of absolute rather than relative differences. This may perhaps be seen more clearly from the following example:

If, in each age group, we select the highest rate experienced by any state in 1940, and the lowest rate, two sets of age-specific rates are obtained reflecting the maximum variation in the rates in that period. Considering these two sets of rates as belonging to two hypothetical population groups, and adjusting them by the direct method and the use of the 1940 U. S. population as a standard, the resultant age-adjusted rates are 17.3 for the high group and 8.3 for the low one. The former is therefore higher than the latter by 108 per cent. What are the components which entered into the creation of this difference of 108 per cent? In Table 5 and Figure 4 an attempt is made to answer this question.

The right hand side of Figure 4 shows the contribution which each age group makes to the total number of expected deaths in the standard population for both the high and the low groups. The difference between the two (the dark bars) represents the excess in expected deaths resulting from the difference be-

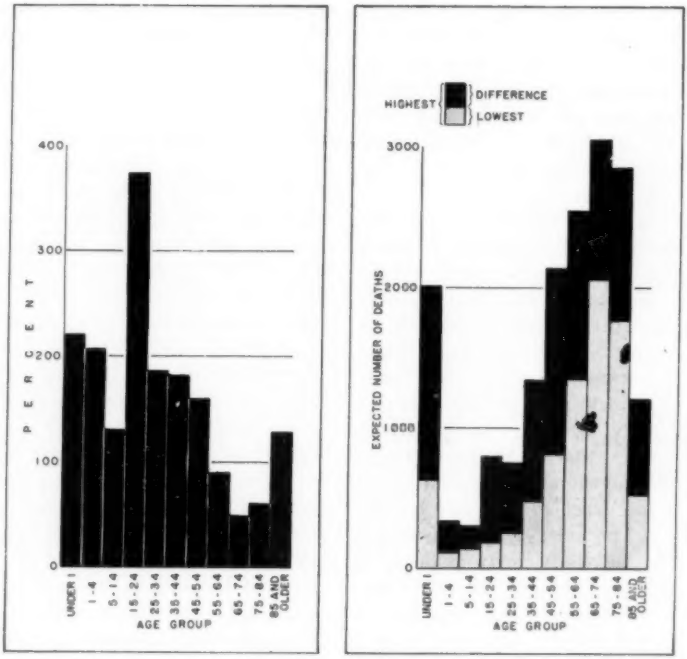

FIGURE 4—The per cent by which the age-specific rates in the high * group were higher than those in the low * group and the distribution by age of the expected number of deaths in the standard U. S. 1940 population.

TABLE 5

*A Comparison of the Age-Specific Rates and the Age-Adjusted Rates for White Males in the High and Low Groups * and the Percentage Distribution by Age of the Excess of Deaths in the Standard United States 1940 Population*

Age Group	Age-Specific Rates		High Group Compared to Low Group	
	High Group *	Low Group *	Per cent difference in age-specific rates	Per cent of excess of deaths in standard population
Under 1	131.5	41.0	220.7	15.3
1– 4	5.2	1.7	205.9	2.5
5–14	1.8	0.8	125.0	1.9
15–24	4.4	0.9	388.8	7.0
25–34	4.6	1.6	187.5	5.4
35–44	9.6	3.4	182.4	9.5
45–54	18.1	7.0	158.3	14.4
55–64	31.7	16.7	89.8	13.3
65–74	63.1	42.2	49.5	11.2
75–84	164.9	102.0	61.7	12.0
85 and over	434.2	190.5	127.9	7.5
Age-Adjusted Rate				
U. S. 1940	17.3	8.3	108.4	100.0
E & W 1901	15.1	6.7	125.3	

* For definition of high and low groups, see text.

tween the corresponding age-specific rates. It is immediately seen that the contribution in the older ages and at infancy dominate the resulting differences between the two age-adjusted rates. The left-hand side of the figure presents the relative difference in the age-specific rates.

A comparison of the two sides of the chart reveals that the difference between the two age-adjusted rates results in only a minor way from the relative differences in the age-specific rates. Neither is the effect of the age structure of the standard population of major importance. The main contributing factor to the difference between the two age-adjusted rates, that is, to the excess of deaths in the standard population, is the absolute *level of the rate* at the different age periods. In periods of life where the mortality level is high, a slight change in the risk of death contributes a relatively large number of deaths to this excess. This may be seen also from the last two columns in Table 5, which compare for each age group the per cent by which the high group exceeds the low group in age-specific rate, with the per cent contribution which the age group made to the excess of deaths in the standard population. For example, at age 15–24 the rate in the high group was nearly 400 per cent higher than that in the low one; however, of the total number of additional expected deaths in the standard population, only 7 per cent are due to that age group.

The comparison of mortality by means of two age-adjusted rates is much like attempting to derive a general impression of death rates in two communities of the same size by plotting the numbers of deaths on an *arithmetic* instead of a *logarithmic* scale.

The fact that the age-adjusted rate is allowed to be influenced to such a great extent by the absolute number of deaths is responsible first for the different results obtained by different standards. For it is obvious that the relative contributions of the different age groups to the excess in the absolute number of deaths will not be the same for two different standard populations. In addition, the results obtained with a single standard are not always in accord with what may be intuitively desirable. For example, if the state of California had had in 1941 a rate for ages 65 and over which was 25 per cent higher than in 1940, it could maintain as low an age-adjusted rate as for 1940 only by reductions which are equivalent to a uniform 20 per cent decrease over the long period of life from birth to age 65. If the 25 per cent increase had prevailed from age 45 on, the age-adjusted rate for 1941 could not be as small as it was in 1940, even if deaths up to age 45 were completely eliminated. Conversely, a decrease of 25 per cent in every age group up to age 55 could be wiped out if a 20 per cent increase prevailed from age 65 on.

A MORTALITY INDEX AS A SUBSTITUTE FOR THE AGE-ADJUSTED RATE

It is abundantly evident from the foregoing that the age-adjusted rate, whatever other qualities it may possess, is not a suitable index for comparing two sets of age-specific rates, if interest is centered on evaluating the comparative risks exhibited in the two sets. If an index is to accomplish this latter end, it must be so constructed that its numerical value will be affected to the same degree by proportionate changes in the age-specific rate, no matter on what point of the age scale they happen to fall. That is, the index must be such that it will evaluate reductions or increases at any age of life as carrying the same weight as similar proportionate reductions or increases at any other age of life.

A set of weights which would accomplish this objective is one whose weights

are proportionate to the reciprocals of a set of age-specific rates of a given population. Such a set of weights may be viewed as representing groups in which a *constant* number of deaths would occur in each age of life, according to the mortality schedule of the selected population. Consequently, an increase of p per cent in any age-specific rate will result in an increase of p per cent in that constant number of deaths, irrespective of the position on the age scale where the increase occurred. The weights are therefore much larger for ages at which mortality is generally low and smaller at ages of higher mortality.

The algebraic expression for this index, in the usual notation, is as follows:

$$_{s}MI_{u} = A \Sigma \frac{m_{ui}}{m_{si}} d_i$$

where

$_{s}MI_{u}$ = Mortality Index for population u derived from age-specific rates of standard population s

m_{ui} and m_{si} = Specific death rates for the i-th age group in community u and in standard population s respectively

d_i = Length of the i-th age interval

A = A constant selected to make the value of $_{s}MI_{u} = 100$

A sample set of weights for the construction of a Mortality Index is shown in Table 6. These were constructed according to the schedule of mortality of the 1940 total population of the United States. The basic elements are the reciprocals of the age-specific rates for this population. They are presented in age groups corresponding to those found in many publications of the National Office of Vital Statistics and have been multiplied in each case by the appropriate length of interval. One adjustment was made in the last age group (85 and over) which is an open interval. Although this interval may cover a relatively long period, the reciprocal was multiplied by 10 in order to avoid assigning to this last age group a greater weight than is reasonable.

TABLE 6

Weights for Mortality Index

Based on the Age-Specific Rates for the Total Population of the United States, 1940

Age Group	*Weights*	*Expected deaths according to 1940 age-specific rates*
Under 1	19	1.04
1– 4	1,454	4.21
5–14	10,160	10.53
15–24	5,140	10.53
25–34	3,441	10.53
35–44	2,024	10.53
45–54	993	10.54
55–64	473	10.53
65–74	220	10.56
75–84	93	10.47
85 and over	46	10.53
		100.00

The constant "A" was selected in such a way as to make the total number of deaths for the selected standard equal 100. This was done because the purpose was to construct an index number rather than a rate in a hypothetical population. In other words, when these weights are used for any other group, the resultant index number will indicate in percentage form the relation of the age-specific rates for the group to that of the 1940 total U. S. population, which has the value 100.

It is important to emphasize that while the actual operation with these weights is the same as that of age adjustment by direct method, the figures in the table are to be interpreted as *weights* and not as representing any population group. They are not intended to approximate any population and, indeed, they are different from any conceivable population. The index which is constructed by these weights may be termed a Mortality Index. It satisfies all the conditions which the age-adjusted rate does, but has in addition the properties of specificity and sensitivity, in the sense that it reflects both the relative differences in the age-specific rates, and the

length of the period in the age span in which these differences prevailed. When, for example, the index for white males in 1940 is compared to that for 1920, revealing a reduction of 35 per cent, it not only presents a figure which intuitively is more in keeping with the actual reduction that occurred during the 20 year period, but it also conveys a meaning which can be definitely stated —namely, that when each per cent change had been weighted by the length of the age scale in which it operated, the overall reduction in the death rate is equivalent to a uniform 35 per cent decrease in each age group all along the age scale.

It may be of interest to derive the values of the Mortality Index for the 48 states and to compare the resultant relative standing of the states with that obtained by the age-adjusted rate. Such a comparison is presented in Table 7 for white males in 1940. The range of the values was from 82.59 for North Dakota to 142.71 for Arizona.

It will be noted that on both ends of the table, only minor changes in rank order occur. This is due to the fact that states with very low or very high rates on a major portion of the age scale can easily be compared and ranked.

In the middle range, however, changes of considerable magnitude in the rank order occur. For example, Rhode Island is ranked 10th lowest by the Mortality Index and 35th according to the age-adjusted rate. Similar changes may be noted for Massachusetts, New Jersey, and New York. On the other end of the scale, Idaho is ranked 17th lowest according to the age-adjusted rate and 40th by the Mortality Index.

In evaluating the two lists of rank orders, attention is directed to the fact that when the ranking is performed by means of the Mortality Index it is at least possible to state, in terms of the corresponding sets of age-specific rates, what meaning may be attached to the relative rank order; while no similar clear-cut statement can be made with respect to the rank order obtained by the use of the age-adjusted rate.

It may, however, be desirable to obtain, by means of an example, a general

TABLE 7

Mortality Index for Each State, and the Ranking of the States According to Mortality Index and According to the Age-Adjusted Rate Based on 1940 Total United States Population as a Standard

(White Males, United States, 1940)

State	Mortality Index	Rank, by— Mortality Index	Rank, by— Age-Adjusted Rate
North Dakota	82.59	1	1
South Dakota	82.72	2	2
Nebraska	85.75	3	3
Minnesota	88.35	4	6
Iowa	88.90	5	4
Kansas	90.06	6	5
Wisconsin	91.99	7	9
Connecticut	93.86	8	13
Oklahoma	93.98	9	7
Rhode Island	95.95	10	35
Arkansas	97.24	11	8
Massachusetts	99.02	12	30
Michigan	99.34	13	12
Missouri	99.84	14	10
New Jersey	100.16	15	36
Delaware	101.15	16	18
New York	102.52	17	38
Ohio	102.91	18	23
New Hampshire	103.53	19	29
Vermont	103.56	20	26
Maine	104.25	21	25
Indiana	104.35	22	16
North Carolina	105.46	23	28
Illinois	105.85	24	33
Washington	107.02	25	19
Oregon	107.27	26	11
Tennessee	107.76	27	27
Virginia	108.34	28	37
Montana	108.91	29	15
Pennsylvania	109.03	30	39
Wyoming	109.28	31	14
Alabama	109.40	32	34
Mississippi	109.75	33	24
Kentucky	109.76	34	20
West Virginia	110.71	35	21
Texas	112.55	36	32
Maryland	112.64	37	43
Utah	113.37	38	22
California	113.77	39	41
Idaho	114.73	40	17
South Carolina	115.21	41	44
Georgia	115.51	42	40
Colorado	116.09	43	31
Louisiana	117.68	44	46
Florida	117.85	45	42
New Mexico	128.47	46	45
Nevada	141.43	47	47
Arizona	142.71	48	48

impression of the difference between the two rankings. The States of Rhode Island and Utah were ranked much differently by the Mortality Index than by the age-adjusted rate. According to the Mortality Index, Rhode Island ranks 10th lowest, while according to the age-adjusted rate it occupies position No. 35. Conversely, the State of Utah is in position No. 38 among the states according to the Mortality Index, while the age-adjusted rate ranks it as 22nd lowest. A direct comparison between the two states is shown in Table 8.

TABLE 8

A Comparison of the Age-Specific Death Rates, the Age-Adjusted Rates, and the Mortality Index for White Males in Rhode Island and in Utah, 1940

Age Group	Age-Specific Rates Per 100,000		Per Cent Difference, Rhode Island-Utah
	Rhode Island	Utah	
Under 1	5300.7	5489.9	− 3.4
1– 4	250.7	299.0	− 16.2
5–14	104.8	153.7	− 31.8
15–24	93.6	245.4	− 61.9
25–34	193.5	384.6	− 49.7
35–44	410.2	617.2	− 33.5
45–54	1114.3	1189.0	− 6.3
55–64	3101.1	2464.4	+ 25.8
65–74	6307.0	4585.1	+ 37.6
75–84	12112.5	11230.1	+ 7.9
85 and over	23600.0	22304.8	+ 5.8
Crude Rate	11.9	10.0	+ 19.0
Age-Adjusted Rate			
U. S. 1940	11.9	11.4	+ 3.5
Mortality Index	95.95	113.37	− 15.4

It will be seen that both the crude rate and the age-adjusted rate are higher for Rhode Island than for Utah, while the Mortality Index shows Rhode Island in much more favorable light than it does Utah. A review of the age-specific rates shows that the rates for Rhode Island were considerably lower than those for Utah from the beginning of life to age 55, but that after age 55 the rates are relatively higher for Rhode Island than for Utah. The age-adjusted rate is influenced by these later increases to nullify the favorable situation of Rhode Island during the relatively large portion of the age scale. The Mortality Index, on the other hand, although taking the increasing rates at the older ages into account, does not assign to them such great weights as to hide the rather favorable position which the state of Rhode Island enjoys as compared to Utah in the very important productive periods of life.

DISCUSSION

The possible merits of the Mortality Index presented here, and its potential use for mortality comparisons, depend on a clarification of the purpose of age adjustment and the needs which it was devised to meet. Presumably the adjustment procedure was introduced to render groups more comparable so that their relative mortalities could be more easily evaluated. The question arises as to what is meant by evaluating comparative mortalities of two groups. In practice, the age-adjusted rates for the two groups are determined, and the ratio of the two obtained. This ratio is presented with the implication that the mortality of A is p per cent higher or lower than that of B. It would be difficult, however, if not impossible, to spell out even in a remote fashion what this p per cent higher mortality really means. Since the age-specific rates are the bricks with which the age-adjusted rate is constructed, it is assumed that the purpose of the latter is to present in summary form the information present in the set of age-specific rates, in order that it may be compared with a similar figure obtained in the same manner from another set. When so stated, the purpose becomes clearer, and the methods for accomplishing it may be more easily evaluated.

Thus, it is evident that a summarization which is based on absolute number of deaths and where comparison is made of absolute differences between rates will inevitably lead to confusion. For the results of the comparison will auto-

matically be interpreted as differences in risk, while the summarization is affected by the relative risks only to a minor degree, compared with the absolute number of deaths, which controls it. Moreover, the comparison of two index numbers thus constructed will convey an impression which is far different from that derived from a detailed comparison of two sets of age-specific rates as it is usually performed.

This does not mean that there are no occasions when the age-specific rates are compared in terms of absolute differences in rates and in absolute number of deaths. The construction of life table functions is such an example. However, when the desired information relates to an evaluation of the relative risks of death, the resultant comparison will be devoid of meaning unless the summarization is that of *proportionate* and not *absolute* differences in the individual age-specific rates.

The Mortality Index presented here is the only one which is constructed on this principle. It therefore has the property that a difference of p per cent between two values of the index conveys the information that Group A has a higher mortality than Group B equivalent to age-specific rates which are higher by p per cent all along the age scale. Moreover, this figure of p per cent presents the composite effects of the relative age-specific rates of the two groups in *both directions*, each weighted by the length of the period in the age scale in which it was present. In other words, in arriving at this p per cent, proportionate credit was given to A for each period of the life span where its rate was lower than that of B, as was given to the latter for each period where its rate was lower than that of A.

It should be noted that the mechanism provided by this index lends itself also to modifications which allow for different evaluations of relative mortalities at different ages if this is desired. All that is necessary is to multiply these weights by another set which assigns different relative values for the different ages. For example, if it is found desirable to weight reductions in infant mortality k times as heavily as similar proportionate reductions at any other age of life, all that is necessary to do is to multiply the weight for under 1 year by k and adjust the weights accordingly. The difference is that in this case the control of the index is in our hands and it can be definitely stated what the relative evaluations are; whereas present methods of age adjustment leave the control of the relative weighting to an arbitrary and accidental distribution of a certain population at a given point of time.

It is obvious that a great number of questions arise relating to the possible adoption of the Mortality Index for place-to-place and time-to-time comparisons. A great many experimentations and trials would be required before its practical utility could be evaluated. A number of problems can easily be anticipated. For example, the values of the index bear no relationship to the numbers in the population experiencing the different rates. Whether or not it is in general desirable that such a relationship exist, it is obvious that in certain cases a limit must at least be set for the proportion of persons experiencing the rate before any changes in it be given equal weights with changes in other rates. In fact, the problem has already been encountered in the construction of the present weights, in that it was found that adjustments were necessary for the age group 85 years and over. Even more difficult situations will no doubt be encountered if indices are constructed for factors other than age. For example, in adjustment for race it will be necessary to face the problem whether it is justifiable to assign equal weighting to changes in the rates for different races in light of the great numerical superiority of the white race.

Another problem relates to the stability of the index—namely, whether weights determined from age-specific rates in one period differ much from those for another period, and if so, which are the more desirable. This could be answered only by extensive experimentation and testing. However, on general grounds it appears that the weights have considerable stability because it is not the level of the age-specific rates but rather their mutual numerical relationship which determines the weights. Since it may be anticipated that future reductions in mortality will not vary by age as much as they have in the past, it is likely that an index constructed with the schedule of mortality for 1950 will serve satisfactorily for a long period of time.

Another serious consideration relates to the reliability of the different age-specific rates along the age scale. In the present discussion the problem was not dealt with. It was assumed throughout that the rates for each age group are based on sufficiently large numbers so that, for example, a reduction at age 20, from a rate of 2 to 1, is real. This question needs to be investigated in terms of the standard error for the index. It should, however, be noted that the problem is not confined to the present Mortality Index but needs to be dealt with also in all other methods of adjustment.

A number of other disadvantages may be quoted for the index. For example, different sets of weights need to be constructed for different causes of death. The weights derived from one cause cannot be used for derivation of indices for a different cause. For each cause of death the index must be derived from its own age-specific rate schedule. This does not seem to be a great disadvantage, however, because there are rarely occasions in which adjusted rates for one cause are compared with those for another.

The Mortality Index is inferior to the age-adjusted rate in terms of simplicity of explanation. It is relatively easy to explain the age-adjusted rate because it is put in terms of another population group, which is easily comprehensible. This handicap, however, may not be as great as first appears, for the frame of reference adopted for the index will assist in comprehension. If, for example, the age-specific rates for 1950, when they become available, are used in the construction of the weights, the value of the index for that year will be 100, and the values of the index for all other groups will provide automatic comparisons to the mortality of the country in mid-century. The situation will be much like that of the cost of living index, which has now become generally accepted and is even incorporated in contracts between employers and employees. There is little reason to suppose that it will be more difficult for the country to grasp the meaning of a release by the National Office of Vital Statistics that the Mortality Index for this year is a certain percentage lower than it was last year. It is likely that in a short time boards of health and county commissioners will learn the meaning of such an index as unions and employers learned to understand the cost of living index.

SUMMARY

The age-adjusted rate as presently employed is an inadequate measure for comparing group mortalities. It lacks specificity and sensitivity and evaluates differently equal proportionate changes when they occur in different ages. It puts relatively heavy premiums and penalties on minor proportionate changes in the older ages. The relative difference between two age-adjusted rates is determined to only a minor degree by the differences in the two sets of age-specific rates. Neither is the age composition of the standard population a major contributing factor. The largest share of

the difference between the two adjusted rates results from the level of the rate at which the changes occur.

A mortality index has been constructed which summarizes more adequately a set of age-specific rates. It is built on the principle that equal proportionate changes affect the index equally, no matter at which point in the age scale the changes occur. It is both specific and sensitive in the sense that when the value for one group is p per cent higher than that for another, it indicates that the difference in mortality between the two groups is equivalent to p per cent higher rates for one group over another along the entire age scale. The summarization provided by the index is such that each change between the two sets of age-specific rates has been weighted by the length of time in the life span in which it operated and was evaluated equally.

It is suggested that this mortality index be tested carefully in its practical application. It appears to possess sufficient merit to recommend it for experimentation and trial.

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The Clark Health Insurance Report

On May 28, Senator Herbert H. Lehman, as chairman of the Senate Subcommittee on Health, presented to the Senate a report on Health Insurance Plans in the United States. Authorized in Senate Resolutions of both the 81st and 82nd Congresses directing further study of health problems, the report was made under the supervision of Dean A. Clark, M.D., as consulting director.

Among its findings are that half the people in the United States have no form of medical care insurance protection and that less than three per cent have comprehensive medical care insurance, including hospital, surgical, and relatively complete medical care insurance.

The report is in three parts, the second being an appendix of seven statements submitted to the Subcommittee by various organizations to be used in preparation of the report. Part III, much briefer than the other two, is a summary of activities of local, state, and federal governments in the field of health. Copies may be secured from the Government Printing Office or from your own Senator.

Brucellosis of Livestock*

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THERE is probably no disease of animals in the United States at the present time that constitutes a more serious threat to public health than brucellosis. Certainly the human brucellosis cases reported each year cannot be disregarded any more than the estimated $100 million annual loss suffered by the livestock industry because of brucellosis in animals. In view of the obvious economic and public health benefits that can be expected from the elimination of brucellosis in animals, there is every reason for all interested groups to support the eradication program.

Within the past few years increasing public health interest in brucellosis has been favorably reflected in the field operations dealing with brucellosis of livestock. The average producer is showing more concern than ever before about the hazards of *Brucella*-infected animals to the health of his immediate family. This attitude is establishing a foundation for the type of coöperative effort essential to successful promotion of the brucellosis project. In fact, the interest, displayed by producers and consumers alike, for eradicating this disease is greater now than at any time since the first organized control effort was started back in 1934.

From the standpoint of public health aspects of brucellosis, the statement, "If there were no infected animals, there would be no infected human beings," seems to be most appropriate in summing up the entire situation. The brucellosis problem is clear-cut in so far as the interrelationship of human health and economics is concerned. Such being the case, it is essential that public health agencies, livestock sanitary groups, and the livestock industry combine their efforts to eradicate the disease. No single group can hope to accomplish too much alone, and the mutual interests that will be served by eventual eradication of brucellosis are adequate inducements for full coöperation.

INCIDENCE OF BRUCELLOSIS IN LIVESTOCK

When the first organized effort to control and eradicate bovine brucellosis was started in 1934, it was estimated that approximately 12 per cent of the cattle in the United States were infected. On the basis of current records covering results of federal-state coöperative testing, it would appear that somewhat less than 4 per cent of adult female cattle are now affected with the disease. With minor exception, the degree of infection is rather constant throughout the country and does not seem to vary between areas as much as might be expected, considering the vast differences in animal husbandry that exist.

Data on the extent of swine brucellosis are too limited for anything more than tentative estimates. Moreover, the inadequacies of the blood agglutination test for diagnosing the disease in individual swine has hindered to some

* Presented before the Conference of Public Health Veterinarians at the Seventy-eighth Annual Meeting of the American Public Health Association in St. Louis, Mo., October 30, 1950.

extent the collection of such information. Preliminary surveys conducted in several midwestern states indicate a much lower incidence of *Brucella* infection in swine than was originally found in cattle. Although sectional variations have been noted, an overall estimate of 2 to 3 per cent seems reasonable at this time.

As in the case of swine brucellosis, the information on *Brucella* infection in goats is also inadequate. So far as we know, *B. melitensis* infection of goats is confined largely to the southwestern states, where most of the goat population in this country is found. The most extensive testing of goats for brucellosis in the United States was carried out in Colorado during the period 1944 through 1947. The highest incidence reported on this project was around 8 per cent, found during the first year. By repeated testing and removal of reacting animals, this figure was reduced in three years to about 1.5 per cent.

Occasional reports are received from Bureau Veterinarians in Charge covering tests made on goats at owner's request. For the area east of the Mississippi River, these reports show very little evidence of *B. melitensis* infection.

For many years it was generally believed that the three recognized *Brucella* types were highly specific for the animal species involved, namely, *B. abortus* for cattle, *B. suis* for swine, and *B. melitensis* for goats. However, a wide range of cross-infections have recently been found occurring under natural conditions. For example, several well documented, milk-borne undulant fever epidemics have been traced to unpasteurized milk from cattle shown to be harboring *B. suis* as an udder infection. Even though research has failed to find an easy method of artificially establishing *B. suis* infection in cattle, it certainly does occur in the field and should be considered in the brucellosis program.

B. melitensis has been identified in cattle only on rare occasions. However, it is reasonable to believe that the infrequency with which it has been isolated is due more to the relatively slight possibility of exposures in this country than to anything else.

B. melitensis has also been identified in swine, but very little is known at the present time about the frequency with which it may occur. Nevertheless, the fact that swine are susceptible in some degree to *B. melitensis* is reason enough to encourage further study of this problem. There has been considerable doubt in several field cases as to the origin of the *B. melitensis* infection involved.

More recently, conclusive evidence has been found that *B. abortus* can occur as a natural infection in swine. This discovery is highly significant from the standpoint of control and eradication of bovine brucellosis and could explain the difficulties encountered in cleaning up some cattle herds.

The elimination of *Brucella*-infected cattle identified by the blood serum agglutination test has been practised extensively over the past 15 years and the test has been found effective when properly employed. The usefulness of the agglutination test as a diagnostic procedure has been established beyond question. There are limitations, of course, in this as well as in all biological tests, but with the present standardization of techniques and materials, these limitations have been reduced to a negligible point.

While Strain 19 vaccination of calves is by no means the full solution to the brucellosis problem, intelligent use of the product can help materially in working toward the goal of eradication by limiting the spread of infection in otherwise susceptible animals. One of the greatest mistakes associated with the use of vaccine has been its too frequent acceptance as a panacea or as an easy way out of a difficult situation. The fact that the protection afforded by Strain 19 is relative and not absolute has been over-

looked many times with disastrous results. Several factors may modify the duration and serviceability of vaccinal resistance. Included among these are (a) virulence of the organism, (b) degree of exposure, and (c) the response of the individual to vaccinal stimulation.

Experience gained over the years from field operations shows that no single procedure is equally suitable for eradicating brucellosis in all herds. Because one method was successful in tuberculosis eradication, many believed the same principle would apply to brucellosis, ignoring the fact that two entirely different diseases were involved. The fact that best results from either test-and-slaughter or vaccination are obtained under conditions which are quite unlike is proof that the tools for a program flexible enough to meet the requirements of any herd are available. It must be remembered, however, that regardless of the initial practices employed, final eradication must depend on the elimination of residual centers of infection through removal of reactors to the blood agglutination test.

UNIFORM BRUCELLOSIS ERADICATION PROGRAM

The need for unifying the brucellosis eradication program was recognized long before any concerted action was taken to bring this about. Finally, as a result of determined efforts made by many interested groups, a uniform program for the eradication of bovine brucellosis was adopted by the U. S. Livestock Sanitary Association at its annual meeting in December, 1947. With minor amendments, made in 1948 and 1949, the present program has gradually evolved from those original recommendations. While it is by no means perfect, the outline has provided a rallying point for those sincerely interested in the development of an effective brucellosis eradication program.

These recommendations have been approved by the Bureau of Animal Industry and provide the basis for federal-state coöperation on the brucellosis eradication project. Nearly all the states have agreed to work toward full compliance with the requirements of the uniform program.

The four plans incorporated in the uniform program may be reviewed briefly:

Plan A: Test-and-slaughter, with or without calf vaccination—This plan has been used successfully in cleaning up thousands of herds. The problems encountered with its employment are frequently greatest in herds where numerous replacements from outside sources are required. Difficulties may also be experienced in highly susceptible herds where virulent infection has recently been introduced. The so-called "test-and-slaughter" method has eradication of the disease as its immediate goal and is the method of initial choice where the incidence of infection is low and herds are self-contained.

Plan B: Test, calf vaccination, temporary retention of reactors—The procedures employed in this plan were set up to cover those herds which, because of a high incidence of infection, might be forced out of business by a straight test-and-slaughter program. When this plan is followed in the recommended manner, sufficient offspring should be available within a period of four or five years to permit replacement of the entire adult herd with vaccinated stock and adoption of *Plan A*. *Plan B* has been very popular throughout the country and is widely used. Its greatest weakness is the lack of limitations placed on the length of time that adult reacting animals can be retained in the herd. There is reason to believe that this fault will be corrected within the near future.

Plan C: Calf vaccination without test of any part of the herd—This plan was designed to encourage range people to

participate in some type of brucellosis program, with the hope that later they would work toward more effective procedures. *Plan C* is confined to herds where the movement of animals is restricted through special permits issued by state livestock sanitary officials.

Plan D: Adult vaccination—Within the framework of these recommendations, adult vaccination is permitted only on approval of state and federal coöperating agencies. This plan was incorporated in the outline only as a possible means of counteracting unofficial vaccination of adult cattle.

While the resistance induced in healthy adult cattle by vaccination with Strain 19 is at least as great as that induced in calves, the resulting blood agglutination reactions tend to persist for indefinite periods. Because these reactions are indistinguishable from those associated with virulent infection, the vaccination of mature cattle automatically places such animals in a class where their true status cannot be determined. Moreover, in the presence of rapidly spreading infection—the condition under which adult vaccination is most frequently practised—little if any benefit can be expected.

At the present time there are no national programs in operation for the eradication of brucellosis from other livestock species, although we may be reaching the point where such projects will be essential. Within the past few years sufficient information has been assembled on swine brucellosis to permit the development of recommendations for the control and eradication of this disease. The results of preliminary field trials, based on these recommendations, are very encouraging and suggest that a practical method for the elimination of *B. suis* infection from swine may be available. The blood agglutination test is not as accurate in diagnosing brucellosis in individual hogs as it is in cattle. However, its use as a herd diagnostic procedure, coupled with segregation of weanling pigs from adult stock, is proving effective in swine brucellosis eradication.

Evidence from area work conducted in Colorado shows that elimination of goats which react to the blood agglutination test for brucellosis is effective in eradicating *B. melitensis* infection from relatively large herds. However, goats reacting in titers as low as 1:25 must be classed as infected, especially in known infected herds, because of the generally rapid decline of Brucella blood agglutination titers in these animals.

Strain 19 vaccine does not provide serviceable resistance in either goats or hogs against *B. melitensis* or *B. suis* exposures.

PRESENT STATUS OF BRUCELLOSIS ERADICATION

During the fiscal year ending June 30, 1950, a total of almost 6 million cattle were officially tested for brucellosis. Of this number, 3.5 per cent were classed as reactors. Not only is this the largest number of cattle tested during any year since 1942, when the war interfered with operations, but the percentage of infection disclosed is lower than at any time during the same period. For the fiscal year 1949, the infection was 4.0 per cent.

It is also interesting to note a corresponding reduction in the percentage of infected herds. For the fiscal year 1948, 18.2 per cent of the herds tested were infected. In 1949 this figure dropped to 16.3, and in 1950 was reduced still further, to 13.9 per cent.

We now have three states, North Carolina, New Hampshire, and Maine, with all counties qualified as "Modified Certified Brucellosis-Free Areas," and there is growing interest on the part of other states to achieve this goal.

As has been true each year since 1940, when vaccination was given official

recognition, the number of official vaccinations increased materially during the past fiscal year, reaching an all-time high of 2,065,063, an increase of about 30 per cent over the previous year.

SUMMARY AND CONCLUSIONS

While it is true that some individuals as well as groups still think only in terms of brucellosis control, there is growing enthusiasm for complete eradication of the disease. Increasing numbers of herd owners throughout the country are recognizing the economic and public health benefits to be derived from brucellosis-free herds.

For many years the brucellosis project has been hindered by the lack of unified effort. Wide differences in views presented a serious obstacle to the promotion of an effective program. As a result of action taken by various agencies and groups within recent years, however, progress has been made in developing a national brucellosis program along uniform lines. The fact that 42 of the 48 states have subscribed to the principles outlined in the new federal-state "Memorandum of Understanding" for brucellosis eradication in livestock is evidence of the advances being made in standardizing procedures.

The shortage of trained personnel is still a serious obstacle to rapid advancement of brucellosis eradication. From the results of continuing research on the ABR or ring test, there are prospects that this procedure will eventually prove to be a valuable adjunct to the blood agglutination test and a means of economically meeting the demands for expanded service. On the basis of studies made in Minnesota, it is estimated that counties having moderate to low infection can be ring-tested for about 10 per cent of the cost of blood testing the same areas. This mainly reflects savings in man-hour requirements. Everyone is hopeful that further research will confirm earlier results and will provide the additional information needed to evaluate the test conclusively.

With the recognition of relatively wide-scale interspecies transmission of *Brucella* types, it becomes more important than ever that all susceptible livestock groups be given serious consideration in the brucellosis eradication program. There is no doubt but that *Brucella* infections can be eliminated with the procedures we now have at our disposal. Although we are advancing more slowly than could be desired, year-by-year records continue to show encouraging progress. With the present growing support being given the project by most interested groups, there is reason to believe that we are approaching the point where maximum accomplishment will be assured.

Bovine Tuberculosis*

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THERE is every reason to be proud of the accomplishments in the *control* of bovine tuberculosis since the program was inaugurated in 1917. However, our goal continues to be eradication rather than control, and so long as any tuberculosis exists in our cattle, there is a potential danger that the disease will assume significant proportions again.

In 1940, the incidence of bovine tuberculosis had been reduced to less than 0.5 per cent, and all states were designated as "Modified Accredited Tuberculosis-Free Areas." At that time, many people believed that such a designation meant complete eradication, and it has been difficult to overcome this attitude. Many veterinarians and state livestock sanitary officials took the position that bovine tuberculosis was no longer a menace and could be dropped completely from further consideration. This false sense of security constitutes the greatest obstacle to complete eradication of the disease. It must be remembered that one cow which is spreading tubercle bacilli can be the source of exposure to any number of other animals if suitable contact is provided. With our present expanded movement of livestock, the chances for such an animal to transmit the disease widely are too great to be ignored. The disturbing number of new foci of infection that are being found throughout the country shows that this very thing is occurring today.

Another situation with which we are faced is the probability of our cattle population becoming more susceptible. During the time when bovine tuberculosis was widely distributed, it is reasonable to believe that a considerable number of unaffected animals built up some degree of resistance to infection as a result of subinfective exposures. We have now reached the stage where this naturally acquired protection has probably declined to a point where most of our cattle are susceptible to less exposure than was required to infect 25 years ago. On this premise, it is possible that the bovine tuberculosis situation is becoming potentially more explosive as final eradication is approached.

FACTORS INFLUENCING COMPLETE ERADICATION

A number of factors limiting our efforts to eliminate the last infected cow have been recognized:

1. In too many instances there is a feeling on the part of the operator applying tuberculin tests that a remote chance of finding a reactor exists and that he is justified in relaxing his vigilance in looking for the disease. As a matter of fact, there is now need for greater efficiency in testing than ever before. Furthermore, many of the younger practising veterinarians have had little, if any, experience in tuberculin testing and in observing the variations in reactions that may be exhibited by infected animals.

2. The lack of interest displayed by some regulatory groups in the tuberculosis project readily explains the same disinterested atti-

* Presented before the Conference of Public Health Veterinarians at the Seventy-eighth Annual Meeting of the American Public Health Association in St. Louis, Mo., October 30, 1950.

tude taken by many livestock people. It is highly important that the cattle owners be reeducated on the continuing seriousness of tuberculosis, as their coöperation is essential to the eradication program. A few bad breaks in herds and areas have done more than anything else recently to awaken the public to the need for completing the eradication job. In carrying out the educational work still to be done in this connection, we are certain that public health groups will be in a position to make an effective contribution.

3. The inability to trace back to herds of origin all non-reacting cattle found to be tuberculous on post-mortem inspection at the packing houses has been a little disappointing. Although the Meat Inspection Division has been very helpful in reporting evidence of lesions to states of origin, many of the actual herds involved are never located. This is due mainly to the fact that a large number of the animals have lost their identity by the time they reach the slaughtering establishments. Some of the states are taking steps to improve this condition by requiring special identification tags for all cattle moving from farm to slaughtering destination.

4. The so-called "problem herd," in which the last infected animal is difficult to find, still exists and presents a real challenge. Work carried out in this country with the English method of injecting tuberculin into the cervical area is proving helpful in these herds. The neck region has been shown to be more sensitive than other parts of the body, including the caudal fold. Some infected animals will exhibit a reaction to cervical injections when the caudal fold is negative. However, because of its hypersensitivity, the test also gives more no-visible-lesion reactors than the caudal fold injection. For this reason, the cervical test has been restricted to use in known infected herds.

5. The need for improvements in testing techniques has been realized for a number of years. This is particularly true with respect to the amount of tuberculin used for routine testing. In the past, the quantity of tuberculin injected varied all the way from a "wet needle" to 0.5 ml. or more. With the present need for extreme accuracy and critical interpretations, it is essential that procedures be more rigidly standardized. It has been demonstrated that a preferred amount of tuberculin for intradermal testing of cattle is 0.1 ml. in herds of unknown status and 0.2 ml. for retests in infected herds. Recommendations to this effect were adopted by the United States Livestock Sanitary Association in 1948 and subsequently approved by the Bureau for use in the official coöperative federal-state tuberculosis eradication program. Highly favorable reports from the field have attested the effectiveness of this modification.

6. The acute shortage of veterinary personnel available for regulatory services during the war made it necessary to relax considerably the testing requirements for maintaining coverage in the Modified Accredited status areas. As a consequence, many of these areas have been retested only on a so-called "spot test" basis. Certainly, the 1 or 2 per cent of the total cattle population tested in many counties has been inadequate from the standpoint of either holding gains already made or advancing eventual eradication. Last year the U. S. Livestock Sanitary Association adopted a recommendation, which was supported by the Bureau, calling for a complete test of all cattle in an area, except range and semi-range animals, within the preceding six years as a prerequisite for reaccreditation after January 1, 1951. This new arrangement will necessarily result in a considerable increase in the volume of testing conducted throughout the country and should be helpful in locating previously undisclosed centers of infection.

CURRENT STATUS OF PROGRAM

During the fiscal year ending June 30, 1950, approximately 9½ million cattle were officially tested for tuberculosis. This is the largest number of cattle tested since 1942, when the war began to interfere seriously with regulatory activities. For the past three years the percentage of infected cattle has remained static at 0.19, even though there has been a progressive increase in the number of tests applied and the number of reactors revealed. It is also significant to note the relative constancy of figures for the percentage of infected herds disclosed during the same three year period. In 1948, 1949, and 1950, tuberculosis was found in 1.4, 1.4, and 1.6 per cent, respectively, of the herds tested.

DISCUSSION

Since the inception of the tuberculosis eradication program in 1917, we have been faced with the problem of educating both the producer and the consumer of animal products on the economic and public health aspects of the disease. Unfortunately, there was too much relax-

ation of these efforts after the entire country was designated as a "Modified Accredited Tuberculosis-Free Area." In consequence, there was less testing, and we have experienced a resurgence of the infection in many sections of the country that can assume dangerous proportions unless prompt action is taken. There is far too much invested in the tuberculosis program to allow any further complacency to interfere with the attainment of final eradication.

Although some expansion of testing has been reported recently, there is still an urgent need for further increase. A fact to be remembered in this connection is that during the early phases of the program, it required the testing of about 25 cattle to find the one reactor that is now located only after more than 500 animals have been tested.

There is still a need for research on tuberculosis in animals, despite the fact that many competent investigators in this field have changed to other lines of study. The development of a more specific tuberculin is one example of several problems that should be solved. The apparent cross-reactions that are encountered in routine field testing are disturbing because of the problem they present to the operator in making interpretations. Some research is being carried out along these lines, but as yet no improved product has been found. It is hoped that all such studies will receive the encouragement needed for their continuation.

The adoption of approved uniform techniques for applying the tuberculin test is of utmost importance. Use of the standard amount of tuberculin has already been helpful in reducing the number of "problem herds," which in many instances have resulted from the failure to detect spreaders of low sensitivity. Such animals are more readily identified when larger amounts of tuberculin are injected. In an effort to improve the procedures employed by accredited veterinarians, Bureau personnel have been instructed to work and advise with the practitioner as closely as possible. Generally speaking, it is felt that the overall efficiency of the work being conducted on the bovine tuberculosis eradication project is improving.

There is no doubt but that an increased interest in the program is beginning to develop in most sections of the country. Many states are thinking in terms of complete retests, especially in areas where considerable infection is either known or suspected to exist. All these signs are encouraging and give promise of more effective progress in the eradication effort if interested agencies, including the Public Health Service, the Bureau of Animal Industry, and state regulatory groups, give the project the support it deserves.

CONCLUSIONS

Finally, if we choose to ignore completely the economic benefits derived from the reduction of bovine tuberculosis, we cannot disregard the public health records, which show a drop of approximately 85 per cent in the death rate from extra-thoracic tuberculosis in human beings between 1917 and the present time. Having accomplished this much, we can do no less than intensify our efforts to eliminate the last infection in our cattle population.

Outbreak of Psittacosis (Ornithosis) from Working with Turkeys or Chickens*

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PSITTACOSIS (ornithosis) is an apparent, or more frequently an inapparent, infection found in parrots, parakeets, canaries, pigeons, finches, and many other birds. While parakeets and pigeons apparently have accounted for most of the psittacosis in the United States,[1] canaries, chickens,[2] and ducks [3] have also been incriminated. Infection is caused by *Miyagawanella psittaci,* which is intermediate in some respects between the Rickettsiae and true viruses. Members of the psittacosis group of viruses have also been recovered from mammals,[4, 5] and human infections lacking history of contact with birds or mammals have been reported.[6, 7]

It appears probable that the importance of common barnyard birds in the spread of psittacosis frequently is overlooked. It is our purpose to describe the salient epidemiological, clinical, and laboratory findings on an outbreak of psittacosis attributed to working with turkeys, and possibly with chickens. This outbreak occurred early in November, 1948, among the workers of a large poultry and egg plant at Giddings, Tex. The first evidence that this was an outbreak of psittacosis was obtained from laboratory tests performed on paired blood specimens obtained from a typical case.

EPIDEMIOLOGICAL FINDINGS

Giddings is a city of about 2,500 inhabitants, located in southeast central Texas between Austin and Houston, surrounded by country well adapted to raising livestock and poultry. The local poultry and egg firm operates plants both at Cameron and Giddings, Tex. All the cases of psittacosis occurred among the employees of the poultry and egg plant at Giddings. This firm also operates a large feed mill at Giddings, but none of the cases were among employees of the feed mill. The Giddings poultry and egg plant is one of the largest in this area. The plant is a one story structure, divided into five or six compartments or rooms, one of which is occupied by the office. The plant processes eggs, chickens, turkeys, and rarely ducks and guineas. Some of the work is seasonal.

Before entrance to the assembly line, the birds are driven from the pens and coops in the rear part of the building through a chute to the killing platform. Few of the workers on the assembly line have occasion to visit the pens and coops. From the killing platform, following the plucking of some feathers, the birds enter the assembly line and pass into the steam bath, where rubber devices remove many of the feathers. The assembly line subsequently passes through a drying oven before entrance to a hot wax bath and a quick dip in cold water, after which the wax is removed, along with feathers. The pin feathers are removed with the aid of dull knives. These operations, both with chickens and turkeys, are quite similar.

Both chickens and turkeys are

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-eighth Annual Meeting in St. Louis, Mo., November 1, 1950.

processed on the same assembly line, but the work is done by essentially different crews. Turkeys are nearly all "New York dressed" * by a Negro crew, and chickens are full dressed by a white crew. Unless there is an unusual rush, the Negroes are laid off or are assigned cleanup or miscellaneous duties while the chicken assembly line is operating. Likewise, except during the big rush beginning about the first of November, the white workers are assigned other duties while the turkey assembly line is running. The white women work with eggs, continue packing chickens, dress any turkeys requiring full dress, or wrap heads. The white men, meanwhile, pack turkeys, grade turkeys or chickens, and perform other miscellaneous tasks. In the Negro crew, the men do the killing, operate the wax machine and allied part of the assembly line, and remove most of the feathers. The Negro women assist the men in the removal of the wax with many adhering feathers and perform the rather tedious task of removing the pin feathers.

As the turkeys arrive in increasing numbers, a point is reached each fall when all other work is greatly overshadowed or entirely stopped in order to take care of the turkeys. Prior to the outbreak, the last chickens (and no other birds except turkeys) were processed before October 20. Relatively few chickens and many turkeys had been processed during the previous ten days. About 3,000 turkeys were processed on October 20, the day after the last chickens were dressed before Thanksgiving. No guineas or ducks had been handled in recent months.

As the principal epidemiologic investigations were made several weeks after the outbreak, it was decided to use the employer's absentee records to assist in establishing dates of onset for those sufficiently ill to require time off from work. The onset of the first case of psittacosis was October 29 and that of the last case, November 8. Sixteen of the 22 cases occurred between October 31 and November 4. Between October 15 and 29, new workers, especially Negro women, were employed almost daily to take care of the increasing number of turkeys. The last date of employment of any worker who became ill was October 23. Twenty of the 22 cases of psittacosis occurred in Negroes, few of whom had been working with chickens. A white supervisor who frequently assisted the Negroes and a Latin American lady who had been wrapping heads and frequently picking pin feathers from turkeys accounted for the remaining two cases.

TABLE 1

Summary of Occupations and Number of Employees in Poultry and Egg Plant

Department	*No. of Employees*	*No. of Cases of Psittacosis*
Killing and Wax Machine	6	3
Wax Removal and Picking Turkeys	28	17
Turkey Head Wrappers	4	1
Dressing Chickens	6	0
Grading and Packing	7	0
Receiving and Miscellaneous	8	0
Supervisors	4	1
Truckers	8	0
Office	7	0
Total	78	22

The occupations of employees are shown in Table 1. There were 22 cases of psittacosis among 78 workers, an attack rate of nearly 30 per cent. Among the 38 workers on the turkey assembly line, exclusive of the white packers, the attack rate was above 55 per cent.

It was evident that the struggling of the birds resulted in the raising of considerable dust at the beginning of the assembly line. However, the Negro men working in the receiving department and performing miscellaneous duties and the white men who graded live birds were obviously more exposed to the dust raised around the birds. None of the

* The birds are picked clean and the heads are wrapped up, but the entrails are not removed.

cases of psittacosis occurred in these groups. The feathers probably were not the source of infection, since the majority of the Negro women who developed psittacosis had been in contact mainly with the pin feathers. The bulk of the feathers had already been removed, and in the process of removal the feathers went through the hot water and hot wax. The negro men and women were obviously exposed to the discharges from the birds. It was noticeable that, as the pickers worked, their noses were relatively near the vents of the turkeys and that in picking pin feathers, discharges frequently exuded from the vents. Furthermore, the turkeys were purposely vented thoroughly along the assembly line before the birds were turned over to the white men for packing.

In view of the explosive nature of the outbreak, it seemed probable that one particular flock of turkeys had been the source of infection. It seemed probable that some turkeys which were dressed on or about October 23 constituted the source of exposure. This would have indicated an incubation period from one to two weeks, in good agreement with that thought to exist in psittacosis. However, it was impossible to draw any conclusion regarding which flock or flocks of birds were to be incriminated. During the busy season many turkeys were unloaded in a common pen at the rear of the plant, and while they were processed as rapidly as possible, the accumulation of the birds represented numerous flocks during a single 24 hour period. The firm obtains produce over a considerable part of the surrounding area, as far away as 150 miles or more. Buying stations are maintained in several cities, where the turkeys are assembled night and day and are trucked to the plants at Giddings and Cameron.

Since psittacosis frequently is a latent, inapparent infection in birds, it was not surprising that the workers were unable to recall that any unhealthy birds had been processed. In fact, it was said that the turkeys had been in unusually good condition.

If the possibility was admitted that some few of the cases could have acquired infection from chickens, it also was impossible to make any inference regarding the origin of a suspect group. Possible implication of chickens seemed highly improbable.

Although the work is seasonal, most of the cases of psittacosis had worked in previous years, and it might be inferred that this outbreak represented the first effective exposure of the group to the disease. There was no evidence of psittacosis in the homes or among contacts of those ill; nor was there any history of any similar illness at other buying stations from which produce is trucked to the Giddings plant.

CLINICAL FINDINGS

Records of 6 hospitalized patients were fragmentary and incomplete. The 15 cases remaining at home were similar and even less completely observed. While several of those who remained at home were seriously ill, others contracted mild influenza-like illnesses and in one or two instances remained at work during the illness. Seven instances of probable subclinical or inapparent infection were uncovered through serologic tests on workers presumably exposed to the disease but without any history of subsequent illness. The onset of some cases was fairly sudden but usually was not severe. In other cases the onset was more insidious. The illness usually was ushered in by vague constitutional symptoms, with few or any symptoms referable to the respiratory tract. The onset usually was characterized by chilly sensations, general malaise, and sometimes nausea or vomiting. With most cases the disease was slowly progressive, and after a few days patients felt much worse. At the height of illness the most

common complaints were feverishness, weakness, nausea, and loss of appetite. Some complained of chills or drenching sweats, and of headache and pain or soreness in the chest. However, these were not general complaints. Relatively few complained of cough.

Abnormal findings on physical examination were particularly negligible at the time of hospitalization, even though illness in most instances had been present for several days and the patients were quite toxic, usually with high fever. During the period of hospitalization, with one possible exception, the patients were without respiratory difficulty and had none of the obvious symptoms of pneumonia such as dyspnea, inspiratory-respiratory grunt, troublesome cough, or typical rusty or blood streaked sputum. X-ray chest plates were made on 3 of the hospitalized patients. Apparently there was little correlation between severity of illness and the degree of pulmonary involvement. Roentgenologists reported that the films showed pneumonitis, or atypical or beginning pneumonia. Since physical signs were minimal, without the x-ray examinations these patients would hardly have been seriously considered to have suffered from a pneumonic process. No rash was reported. Enlargement of lymph glands was not observed. The spleen or liver was not recorded as being palpable. Abdominal distension was troublesome in the more severe cases and abdominal surgery was contemplated but not done on two cases.

The usual supportive treatment was followed with hospitalized patients, and they were treated with penicillin. Although the patients as a group were admitted to the hospital late in the illness, there was some evidence that penicillin was beneficial in treatment. Other antibiotics were not utilized. The duration of illness varied from 1 or 2 days to 4 or 5 weeks. More than half of the cases were ill 2 or 3 weeks or longer. Those more seriously ill convalesced slowly. One patient had a late relapse, but recovery generally was uneventful. There were 2 deaths among non-hospitalized and 1 death among hospitalized cases. Deaths were originally attributed to widely different causes. Unfortunately, autopsies were not performed.

LABORATORY FINDINGS

Blood counts and hemoglobin determinations were not made. Agglutination tests with *Salmonella typhosa, Brucella abortus, Proteus* OX19, and *Pasteurella tularensis* as antigens were performed on sera from 6 hospitalized and 5 non-hospitalized patients. The results were essentially negative. The heterophil test was found negative on 6 cases. A few late convalescent sera were tested for cold agglutinins for atypical pneumonia and gave essentially negative results.

Sera obtained from patients in late convalescence or several weeks after recovery from illness invariably showed significantly high complement-fixation titers with LGV antigen. A modified Kolmer, quantitative complement-fixation procedure, as used by Rake and others,[8, 9] and recommended by them for use with LGV (Lygranum) antigen, was followed. This antigen is prepared from the yolk sacs of embryonated eggs. Positive and negative serum controls were included in each series of tests. Whenever it was possible, paired or serial blood samples were obtained and tested simultaneously. Results could be duplicated without much variation in the serum titers. Normal yolk sac antigen was included as a control on each test. Serum reactions with the antigen control were infrequent, and in only one instance was a 3- or 4-reaction at 1:10 dilution obtained. All sera from psittacosis cases or from persons in the exposed group, with one exception, reacted at titers more than fourfold greater than with the antigen control.

TABLE 2

Results of Serial LGV Complement-Fixation Tests on Psittacosis, Case (H.R.)

Tests		Serum Dilution						
Date of Onset of Illness	Date of Bleeding	1:20	1:40	1:80	1:160	1:320	1:640	1:1280
November 1, 1948	November 8, 1948	4	3	±	—	—		
"	November 10, 1948	4	4	4	4	±	—	
"	March 25, 1949	4	4	4	4	4	2	—
"	June 14, 1949	4	4	4	4	4	+	—

TABLE 3

Results of Tests with LGV Antigen on Late Paired Sera

Patient	Date of Onset	Date of Bleeding	Serum Dilution 1:20	1:40	1:80	1:160	1:320
C.C.	11–1–48	3–25–49	4	4	4	±	—
		3–30–50	2	—			
N.W.	11–1–48	3–25–49	4	4	4	4	2
		6–13–49	4	4	4	3	—
		11–2–49	4	4	2	±	—
W.Y.	11–5–48	3–25–49	4	4	3	±	—
		6–13–49	4	4	3	—	—
		11–2–49	4	2	—	—	
A.B.M.	Exposed; not ill	10–26–49	4	4	4	3	—
		3–30–50	4	4	3	—	—
L.V.	11–2–48	3–25–49	4	4	4	4	3
		10–26–49	4	4	4	3	±
C.R.	11–3–48	8–2–49	4	4	2	—	
		10–26–49	4	±	—	—	

Sera from 6 of the 22 cases reacted strongly in the Kline exclusion test and presumably were syphilitic. Serum from one case reacted about equally well with LGV antigen and antigen control. Syphilitic sera have frequently been reported to show a high rate of LGV reactions, usually because of exposure to the virus of lymphogranuloma venereum. The LGV complement-fixation reaction is obtainable following infection by other members of the group, including psittacosis [10, 11] and inclusion blennorrhea and trachoma.[12]

The results from serial bleedings on case (H.R.), as shown in Table 2, indicated a significant increase of the LGV titer during the second week of illness. While this was the only case from which a blood specimen was taken early enough to detect a rising titer, the finding was highly significant of infection by one of the members of the psittacosis-lymphogranuloma group of viral agents.

The results with other cases on which LGV tests were performed over intervals sufficient to detect falling titers are shown in Table 3 and are significant. In most instances fairly high titers were maintained, at least for some weeks.

The specificity of the LGV complement-fixation test was also shown by employing several of the same sera in somewhat similar tests, except that Lederle endemic typhus, spotted fever, and Q fever antigens were used in the place of the LGV antigen. These antigens are also prepared from the yolk sacs of embryonated eggs. None of the sera from the psittacosis cases showed significant complement-fixation with these antigens, although the antigens reacted in high titers with control serums from patients or animals known to have been infected with typhus, spotted or Q fevers, respectively.

A control group of 41 sera was collected at Giddings in September, 1949. These sera were taken principally from

Negroes who were employed at the poultry and egg plant at the time but were not working in October, 1948, and from contacts including some of the members of families of the psittacosis cases. Only 1 of 41 reacted at a titer of 1:40 or more. While the history on this individual was consistent with a diagnosis of lymphogranuloma venereum, it appeared that the incidence of this disease among the employees of the poultry and egg plant was not high enough to have influenced appreciably any significant number of the elevated LGV titers obtained on sera from the psittacosis cases.

The occurrence of unrecognized illness or inapparent infection resulting from exposure presumably explains the titers obtained on sera from a small group of presumably exposed persons, as shown in Table 4.

Phenolized yolk sac antigen, incorporating feline pneumonitis virus and prepared by us in the manner described by Davis [3] with psittacosis virus, reacted with good titers on psittacosis sera. Some of these sera were tested and found to react with psittacosis antigens.*

Since the cases were convalescing or had already recovered from illness when this outbreak came to our attention, only one blood clot was available for attempted recovery of the psittacosis virus. This attempt failed, possibly in part because of poor storage of the specimen.

TABLE 4

Distribution of LGV Titers in Serum of Cases and of Persons Presumably Exposed but Not Ill

Titer	*Ill*	*Not Ill*
1:20	0	3
1:40	5	3
1:80	5	0
1:160	5	2
1:320	3	0
Total	18	8

* Dr. Herald R. Cox, Viral and Rickettsial Research Laboratories, Lederle Laboratories, Pearl River, N. Y., and Morris C. Shaffer, Department of Bacteriology, Tulane Medical School, New Orleans, La., found that sera representative of this outbreak reacted in significant titers with psittacosis antigen.

DISCUSSION

In this outbreak of psittacosis, all cases had been killing, picking feathers from, or wrapping heads of turkeys in the local poultry and egg plant. The majority of the cases had not been dressing chickens. It appeared probable that discharges from a group of turkeys dressed on or about October 23, 1948, constituted a source of the outbreak. The Negro women who picked pin feathers and showed the highest attack rate were particularly exposed to discharges from the birds. The mode of transmission could have been through inhalation of droplets or through abrasions of the hands. The wrapping of the heads and rinsing of the birds after their venting evidently was sufficient to protect the white men who packed the turkeys. It seemed likely that the number of illnesses would have been increased had the turkeys been full dressed. The apparent lack of infections in the packers and other groups which came in contact with the turkeys possibly was an indication of earlier exposures. However, most of the cases of psittacosis were among persons who had worked at least during the turkey dressing season for years, and the high attack rates in these groups strongly suggested that these workers as a group had not been previously exposed to psittacosis. The explosive nature of the outbreak strongly suggested that one flock of turkeys was the probable source of infection, but it was impossible to identify this flock.

The clinical findings were similar to those described by others.[14, 15] The cases were similar except for wide variations in the severity of illness, which ranged from mild influenza-like attacks to grave illnesses, with 3 deaths. Evidences of a frank pneumonic process were not necessarily an accompaniment

of infection, nor was there any direct correlation between the changes in the chest and the severity of the illness. Roentgenologists reported that the chest plates showed pneumonitis, or atypical or beginning pneumonia. Convalescence was frequently slow but generally uneventful. There was evidence that penicillin was of some value in treatment.

The LGV complement-fixation test was utilized to good advantage in the investigation of the outbreak. While in one case a significant titer increase was obtained early in the second week of illness, a significant titer increase perhaps may be delayed frequently until the end of the second week. The complement-fixation test was of great assistance in retrospective recognition of infection by a virus of the lymphogranuloma-psittacosis group. It should be emphasized that the use of a killed antigen in serologic tests as a diagnostic aid is preferable to attempts to recover and identify *Miyagawanella psittaci* because of the extreme infectiousness of this agent in the laboratory.

SUMMARY AND CONCLUSIONS

An outbreak of psittacosis occurred in turkey dressers at Giddings, Tex., in 1948. There were 22 cases and 3 deaths among 78 employees of one establishment.

Epidemiologic investigations revealed that the discharges from a group of turkeys constituted the most probable source of infection. It seemed very doubtful that any of the cases of psittacosis had acquired infection from chickens. The cases as a group presented a syndrome characterized by fever, constitutional symptoms, and minimal signs or symptoms referable to the respiratory tract. LGV complement-fixation titers for the lymphogranuloma venereum-psittacosis group of infections generally reached and maintained high levels, at least for some weeks.

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Poultry Sanitation Standards*

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GREAT progress has been made in the very broad field of sanitation during the first half of the present century. We can be proud of the headway made in the realm of water supplies, waste disposal, milk and shellfish sanitation, and the sanitation of eating and drinking establishments.

Lest we be carried away by our achievements, let us consider the area of poultry plant sanitation, to which most of us have given very little attention in the past but with which we are now becoming increasingly concerned. Is there justification for such concern? Generally speaking, there is a marked lack of supervision of poultry dressing establishments. Inadequate provision is made for the inspection of poultry for wholesomeness. The design and construction of the plants, including equipment and containers, and the food handling methods employed in many of the poultry dressing plants are in need of immediate improvement.

There were relatively few large poultry slaughtering plants in existence 30 or 40 years ago; consequently, little or no provision was made for the inspection of either the poultry carcasses, or the plant facilities, or methods of operation. Poultry for the most part was marketed in the live state and often slaughtered in the home. Under such an arrangement, the consumer had an opportunity to examine the live bird and to exercise precautions during the dressing procedure. Today, it has been estimated that not one bird in every hundred consumed in the United States is seen alive by the ultimate consumer.[1] To be sure, the method of handling the fowl at home was sometimes quite inadequate from the standpoint of sanitation. On the other hand, poultry was not exposed to the possibilities of contamination involved in mass dressing, evisceration, packing and the many intermediate processes to which much commercially slaughtered poultry is subjected today.

Certainly anyone who has observed poultry plant operations from the public health point of view does not have to be convinced of the need for poultry inspection programs. Were we to go beyond the mere observation of plant operation and to explore, by means of actual epidemiological research, the possibilities of disease transmission to man through poultry, we undoubtedly would be startled by the findings.

There are a large number of organisms common to man and animals, and more specifically to man and poultry. In this regard, investigators are agreed that the Salmonella group of organisms is of great concern to the control official. In 1939 the statement was made[2] that poultry constituted the greatest reservoir of paratyphoid infection among domestic animals in the United States. This was substantiated by the report of Darby and Stafseth[3] which shows that up to 1942, 35 species of Salmonella organisms were found to affect birds.

* Presented before the Engineering Section of the American Public Health Association at the Seventy-eighth Annual Meeting in St. Louis, Mo., October 31, 1950.

Considerable evidence has been published concerning infections in man by the avian Salmonella organisms. Barnes [4] has concluded that "Fowl are by far the main animal reservoir of organisms affecting man; this is a point that cannot be overemphasized, since it may often aid in solving the origin of an outbreak of salmonellosis."

The latest report of the U. S. Public Health Service on disease outbreaks conveyed through foods other than milk,[5] as compiled from reports submitted by the various states and cities, shows that in 1948 there were 9,962 cases in 327 such outbreaks. Of this number, 8,832 cases in 289 outbreaks were listed as food infections, food poisonings, and gastroenteritis. Specifically 2,492 cases in 61 of these outbreaks were attributed to poultry and poultry dishes. Unfortunately, the figures cited from the Public Health Service report represent but a fraction of the actual number of such outbreaks. It is reasonable to assume that many thousands of cases of food-borne disease occur as individual or sporadic cases and not in outbreak form. We know from our own experience that only a few of these cases are ever investigated or even reported. Furthermore, only a fraction of the states require the reporting of food poisoning and food infection.

It is quite likely that some of the other food poisonings which were reported, although attributed to foods other than poultry, were due originally to soiled kitchen equipment, utensils, or the employee's hands. These items may have become contaminated by exposure to carcasses infected with or harboring infectious organisms, by fecal matter, or by healthy carcasses which may have been contaminated during the processing operation. Felsenfeld and Young,[6] in a study on the survival of Salmonella organisms transferred by the fecal droppings of poultry upon vegetables, determined that *S. pullorum* survived from four to eight weeks on refrigerated vegetables, and from two to five weeks on vegetables stored at room temperature.[6] *S. typhimurium, S. montevideo* and *S. oranienburg,* under similar conditions, survived on an average of two weeks longer than *S. pullorum*. It is obvious that this chain of disease transmission can be quite formidable and extends into commercial food handling establishments as well as private homes.

The consumer needs protection against contaminated or diseased poultry and has the right to expect that the poultry for which he pays the market price is wholesome. When the viscera are removed and the poultry carcass is cut up ready to cook, the consumer's only guide to wholesomeness is in the appearance and odor of the bird. In the case of frozen poultry, he can hardly depend on these. Can he rely on all owners of the poultry dressing plants, all plant supervisors and employees, to recognize and discard all diseased birds, as well as to apply the modern principles of sanitation to their operation? Unfortunately, the answer is "no."

Some members of the poultry industry voluntarily subject their plants and the products therefrom to continued inspection for wholesomeness and for compliance with established principles of effective sanitation. Not only are they concerned with distributing a clean, safe, wholesome product, but they realize the soundness of doing so from the standpoint of good business. They realize that a good product means increased sales, less spoilage, and a better name. For the most part, however, the poultry dressing plants need guidance with respect to inspection for wholesomeness, proper design of the plant equipment, and proper methods of handling poultry by persons who are especially qualified in this field. Those plants which selfishly disregard basic sanitary practices in favor of temporary

economic gain need to be disciplined.

Although this discussion is limited primarily to the sanitation aspects of poultry inspection, mention should be made of the very important phases of the overall program, namely, the inspection of the carcass—ante-mortem and post-mortem—for freedom from disease conditions; the disposition of the diseased or unwholesome carcasses; and the proper identification of the carcasses. This subject is being given thorough consideration in the Veterinary Public Health Section meetings of this convention. Certainly we are all agreed that poultry, to be fit for food, must first of all be free from disease. In this respect no diseased carcass should be permitted to pass through the processing operation because of the danger of contaminating the processing equipment through which will pass disease-free carcasses.

There has been much discussion of late concerning the inspection of poultry and the development of a model poultry inspection ordinance, for adoption by communities as local ordinances, or by states as law or regulations. The Public Health Service has received numerous inquiries from state and local health departments on this subject. The State and Territorial Health Officers considered in some detail the problems of poultry inspection at their annual conference in 1948.[7] By means of a recent survey questionnaire sent to all states and territories,[8] we found that of the 37 states which completed the questionnaire, only 14 are presently engaged in poultry inspection work. Twenty-seven of these states, however, have legal authority for poultry inspection. In 7 states this authority is provided for by specific enabling legislation, while in 10 states it is implied. This legal authority provides for inspection of plant facilities for sanitation in 24 of the 28 states reporting on this item, and for ante-mortem and post-mortem inspection in only 4 states, namely, Kansas, Maine, Minnesota, and Pennsylvania.

Of the 28 states which expressed an opinion on the questions as to whether or not poultry inspection is considered a public health problem, 13 answered in the negative. Furthermore, 17 states not presently engaged in poultry inspection activities stated that no such program is under consideration. Thus it seems that there is a definite need for the education of a large percentage of the state enforcement agencies concerning the importance of poultry inspection programs. Although these statistics do not reflect the nature of the inspection work or the adequacy of state poultry inspection programs, they indicate that the poultry dressing industry in most areas of the country does not have adequate guide lines to follow in designing and constructing plants, in the purchase of equipment of approved design, and in the application of sanitary methods of operation. By the same token, the enforcement officials lack good counsel on the basic points to be considered in establishing good poultry sanitation programs.

It is obvious, therefore, that one of the most urgent needs in the field of poultry inspection at the present time is a model ordinance and code which will be complete with respect to requirements concerning the aspects of wholesomeness and freedom from disease. These go hand in hand with sanitation requirements, such as sanitary design and construction of equipment and containers, cleaning and bactericidal treatment of equipment and containers, sanitary handling of the poultry carcasses, etc. The poultry dressing industry needs such an ordinance and code if it is to fulfill its obligation to produce a safe, wholesome product and if it is to know what is expected from the standpoint of public health. The enforcement agencies also need such an ordinance and code to specify what they can

and should expect of the industry.

The next consideration is the kind of legislation needed. This is often passed off lightly by saying, "Anyone can draw up an ordinance," or "Forestville has a poultry inspection ordinance—let's adopt theirs." Unfortunately, this procedure is frequently followed in the absence of a standard model ordinance. The result is that a conglomeration of unwieldy ordinances are adopted throughout the country—some good, some poor. As most people know, the development of a good, workable ordinance and code is a tremendous task and requires the careful consideration and help of industry and officialdom alike. It is important, in fairness to the industry, to enforcement officials, and to the consumer, that these standards be uniform in requirement throughout the country. It is particularly important with respect to poultry because of the extent to which this type of food is now being shipped in interstate and intrastate commerce.

Those of us in the field of public health sanitation are being challenged as to what we are going to do about the problem of poultry plant sanitation standards. We can wait for the more progressive members of industry to establish the standards for us, or we can assume our responsibility as public health officials to pool our efforts with those of other agencies and the industry in the development of sound poultry dressing plant sanitation standards. Obviously, the latter is the logical approach.

Uniform standards are needed by the industry for use in plant construction and selection of equipment and in the employment of proper methods of plant operation. They are needed also by enforcement agencies as basic material to be used in educational activities for plant managers and employees, for inspectional supervision, and occasionally for legal action. It is imperative, therefore, that these standards represent the combined efforts of the industry and the enforcement agencies concerned.

It is important that these standards be formulated in such a manner as to be acceptable for adoption as a local ordinance or state law, and also to be acceptable to enforcement agencies throughout the United States. Thus, both industry and the enforcement agencies may benefit by reciprocal supervision of poultry dressing plants. These standards should be supplemented by a code of interpretations and also by a standard compliance rating procedure. Such a rating procedure would serve as a measure of the degree of compliance by industry with a certain standard; and of the quality of supervision provided by the enforcement agencies.

The question that comes to mind here is, what is the best procedure to follow in developing such standards? First of all a collection of existing regulations dealing specifically with poultry plant sanitation should be made to serve as a basis and as reference material for the development of a model ordinance. The regulations of the U. S. Department of Agriculture governing the inspection of poultry [9] would be of great value for this purpose. Of particular value also would be the Ordinance and Code Regulating Eating and Drinking Establishments Recommended by the U. S. Public Health Service. This ordinance has been adopted as law or regulation in 29 of the states and the District of Columbia, and as a local ordinance in 212 counties and 529 municipalities located in 43 states and the Territory of Alaska. Because of its wide acceptance, it is recognized as being the nearest approach we have to a national standard in this activity.

Mention is made of this Public Health Service recommended standard because first of all it contains many sanitation provisions which are directly applicable

to poultry dressing plants, and secondly it is evidence of the results of the active participation of state and local enforcement officials, industry, and federal agencies in the development and subsequent revision of sanitary standards. It appears logical that this approach could well be followed in the development of poultry dressing plant sanitation standards.

We might profit by a summarization of the sanitation standards which should be included in legislation governing the slaughter of poultry. The entire plant, including floors, walls, ceilings, and equipment, must be so arranged as to be easily cleanable and, of course, must be actually maintained in a clean condition. To be easily cleanable, the plant structure and the equipment must be in good repair. Those items of equipment with which food comes in contact must be washed and given an approved bactericidal treatment before each usage. The plant must be well lighted and properly ventilated. An adequate and safe water supply is needed. Hand washing facilities, including hot and cold water, soap, and towels, must be conveniently located to poultry handling operations. Toilet facilities must be readily available to the employees. Adequate provision is needed for the sanitary disposal of all plant wastes. Pests such as flies, roaches, rats, and mice must be effectively controlled, first by building them out and eliminating harborage areas, second by eliminating the availability of food, and finally by extermination and constant vigilance against reinfestation. Adequate effective refrigeration is essential. Ample storage space for both the poultry product and supplies such as containers, detergents, bactericidal agents, etc., is needed.

Constant supervision must be provided by the management of the plant for the training of employees who handle the poultry and for the routine inspection of the various poultry handling operations. The employees must be free from communicable disease; must follow certain established practices of personal hygiene, such as washing hands after visiting the toilet or otherwise contaminating them; must wear clean and appropriate clothing; and must refrain from spitting or using tobacco in rooms where poultry is being dressed, handled, or stored.

Poultry inspection legislation, like legislation for other food products, must contain provisions for the issuance of permits, for the frequency and type of inspections, for examinations of the product for freedom from contamination and adulteration, and for punitive action.

Last, but by no means least among the provisions of an ordinance, is a code to explain and interpret in greater detail than is possible in the ordinance the various requirements contained in it. Experience has proved beyond question the need for such a code to provide uniformity in interpretation and enforcement of the ordinance and to maintain a better understanding between enforcement officials and industry.

Although the development of standards is essential to a good poultry plant inspection program, it should be emphasized that such a program is no better than the application or enforcement of the standards established. A concerted educational program organized to explain the public health reason for each of the items comprising the model standard is essential. It should explain also what is considered satisfactory compliance for these items. The program should be directed not only to the plant employees but also to the owners, managers, and supervisors. It is imperative that they assume their responsibility in training their subordinates to apply the principles of good sanitation. The enforcement agencies are responsible for the employment and training of the inspectional personnel.

Finally, the consumer must be informed of the importance of poultry inspection, given the reasons why the poultry which he buys should be from inspected sources, and be shown the means of recognizing inspected poultry. He must be impressed with the fact that he can have confidence in the use of poultry from inspected sources.

Any discussion of the merits of poultry inspection from the public health point of view would be incomplete without mention of world needs for food conservation. The activities of the Food and Agriculture Organization of the United Nations in the postwar period have clearly indicated the need for conservation of all food supplies. One of the major world health problems is the competition between an increasing population and the available food supply. The application of good sanitation measures in the handling of poultry reduces the amount of spoilage of such food, thus making available to Americans and other peoples of the world larger supplies of poultry to meet their nutritional needs.

In conclusion it should be emphasized again that poultry plant inspection is an essential part of any disease prevention program. We, as public health officials, are obligated to take an active part in the development of adequate and meaningful poultry inspection programs throughout our country. In doing so, it is important that we first of all develop uniform standards which represent the combined efforts of industry and of the official agencies concerned with the overall problem, and then actively promote the adoption and uniform enforcement of these standards throughout the United States.

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Socio-Economic and Public Health Aspects of the Aging Process*

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THE INDIVIDUAL AGING PROCESS

THERE are two kinds of aging process: individual and social. As the individual lives more years, his biological organism undergoes structural and functional changes, most of which are yet little understood. Increasingly he becomes a victim of persistent illness. Likewise his social situation changes: His family grows up and leaves home; spouse, siblings, and close friends begin to die off; retirement from work is forced by illness or employment policy; income drops. As the number of birthdays passes 60 and cosmetic changes appear, we come to be categorized as old, conservative, has-beens. Society defines our role for us, as it does at other periods; but this time it is essentially a definition of withdrawal from the stream of things.

These organic and socio-psychological changes come to all of us if we live long enough, and we are forced to make adjustment to them. Adjustment to aging is a complex process in itself and one for which we have a good deal of individual responsibility. Like all other life adjustment, however, it takes place in a cultural setting and it is partly a function of the degree of adjustment in earlier periods of life.

There has been growing evidence that older people are resistant to the passive role we have tended to assign them, and there is ready explanation for it. Human aging is a highly differential process. In learning this fact, we have discovered that the psychological function or mental capacity persists much longer than we had supposed. As a result, older people do not seek retirement from work and affairs; rather they, and this includes us, prefer to continue as participating, wanted members of the community. One of the challenges to public health, then, is that of helping to bring social attitudes toward aging and older people into line with newer knowledge of their capacities and interests.

AGING IN AMERICAN SOCIETY

The societal aspect of aging is marked by the rapidly growing number and proportion of older people in the population. Up to now this has been largely a function of the declining proportion of children born into the population. The decreasing number of children per family, together with the growing number of older people, means that there are fewer children to share responsibility for aging parents. And since people are living longer, children are faced with the problem for more years of their lives.

Industrialization—The difficulty of meeting the needs of older workers is aggravated by other changes that have paralleled population aging. Industrialization has converted a growing proportion of jobs into wage or salaried positions which workers hold largely at the pleasure of others. Simultaneously,

* Presented at a Joint Session of the Epidemiology, Health Officers, Medical Care, and Statistics Sections of the American Public Health Association, at the Seventy-eighth Annual Meeting, in St. Louis, Mo., November 3, 1950.

output per worker has increased fivefold during the past century [1]—faster than our capacity to consume the product. The result has been progressive shortening of hours and a tendency to retire workers who live into the older ages. It is most difficult for the older worker who becomes unemployed to find a new job.

The severity of this situation can be seen when one realizes that the average years of life after age 65 is more than 13 years,[2] and that this average will probably increase considerably during the next generation. A period of 13 years is a long time to spend in retirement—a period approaching the equivalent of one-third of the normal working span. It is also a long time to be supported from savings or pension—a fact which has led some to call aging the most critical economic problem of our time.

Urbanization—Another environmental change is the shift of the American population to cities. The small dwelling units characteristic of urban life and of the shrinking two-generation family make it difficult or impossible for grandparents to live with their children, and this complicates the problem of older people in finding living arrangements that satisfy their needs. Even when homes are large enough, there are often personality conflicts among the generations because of lack of useful work for the older people, combined with their need for financial support. In brief, the three-generation family is no longer a self-sufficient, economic, producing unit. Grandparents are not essential to its survival.

While this situation is perhaps most characteristic of cities, there is evidence that it has counterparts in small towns and rural communities.

Lack of Facilities for Older People—The third societal aspect of aging is that the situation has come upon us largely unawares and we have not made adequate provision for it. Industry was developed in relation to a population that was old at 45. Cities were built to meet the requirements of smaller, two-generation families. The same has been true of other aspects of institutional life. There are many facilities and services for children and young adults, developed when 50 per cent of the population was under 21. There are few opportunities for older people to find the health services they need, make new friends, learn and practise creative activities, retrain for new jobs, seek recreation, and participate in educational and community experiences.

EFFECTS ON SOCIETY

This, then, is sketchily the situation in which older people are forced to make adjustment. It is apparent that society, too, is called upon to make adjustments. These adjustments may be orderly or not, much as in the case of the efforts of the individual.

Awareness is now increasing rapidly. When plans were made for the recent Conference on Aging, we hoped to have from 350 to 400 delegates. Little was known about the number of people interested in aging. Rather optimistically we provided facilities for 800. I think it is significant that at the height of the vacation season 816 persons attended the Conference and a sizable number were turned away. The conferees included many professional health and welfare workers but also farm and labor leaders, industrialists, business and insurance men, educators, and officers of fraternal organizations and women's clubs.

The effect of aging on the economy is fundamental. The growing number of older people can become financial dependents. In 1948, about 3½ million of the 11 million persons 65 years of age and over in the United States had no money income of their own. Of the 7½ million with some money income,

almost one-third had incomes of less than $500.[3]

American society has decreed that all of its people shall be supported in minimum decency and health. The President of the United States recently said that the nation's strength lies in this determination.[4] The declining proportion of children in relation to the population in the productive ages will not offset the increase among the elderly. Fewer children do not mean less expense, because we insist upon more for them. (Indeed, that is probably why we have fewer.) The elderly will become more expensive as we recognize the implications of their desire to live through the older years in active, satisfying ways. Everyone knows the pressure being applied by the so-called pension groups in the western states and the current initiative petition in Massachusetts to create a state lottery for the support of older citizens.

Older people derive their incomes from gainful employment, work-connected pensions, savings, help from relatives, and through government in the form of direct payments or services in kind. Economists at the Conference on Aging were skeptical about increasing employment; they concluded that savings and contributions from relatives will decline and that considerable increased support will be provided by or through government agencies.

The recent amendments to the Social Security Act represent a step in this direction and two of them are of particular significance to public health. One of these is the establishment of a new public assistance category—the totally and permanently disabled. The amount appropriated for the care of this group for the remaining three-quarters of this fiscal year is $50 million. The other is the amendment providing for direct payments to vendors for health care for 3 million or more recipients of old age assistance. Surgeon-General Scheele has already discussed the implications of these developments with various groups of public health workers.

EMPLOYMENT

The two problems I wish to discuss in some detail are employment and living arrangements. I have selected these two because of their importance and because there is no clear agreement that they are public health problems.

Employment of older people is important for at least three reasons: (1) it satisfies the needs of many for financial security and the feeling of usefulness; (2) it maintains their status as income producers rather than financial dependents; and (3) it takes advantage of their capacities as producers of goods and services. The last is of special importance right now, for it has been said that the United States cannot meet the requirements of defense production without the contribution of the older segment of the population.

Probably the first question to be settled with reference to this problem is that of employability of older workers. In the past they have been retired or have not been hired because of their alleged slowing down, deterioration, resistance to new processes, susceptibility to injury, and the like. We need to know what the real situation is and I think the required research is a function of public health as much as of any other group.

Fundamentally, of course, we need basic information on the functional residuals or capacities at various ages. It should be possible to set up normal ranges of capacity with reference to strength, speed, agility, learning capacity, and fatigue, and to relate these to job requirements. It is suggested that studies of changing capacities should be longitudinal and that they will require periodic redoing. The same factors that are responsible for postponing death may also be prolonging the

period of high vitality and hence, of employability.

Researches in this field will have to be interdisciplinary in character. Biological and medical research workers will be concerned with physiological functioning and physical capacities; psychological experts with motivation, flexibility trainability, and mental capacities; personnel workers with job requirements.

Without waiting for completion of these long time, fundamental studies, we should have more information on absenteeism, incidence of accidents and length of recovery period, worker mobility, and—most important of all—inter-age comparisons of productivity or job performance. It has been observed before that the time to make such studies is during periods of full employment, when a high proportion of older workers is to be found on the job.

Here and there is an establishment already experimenting with a retirement program based on estimated performance capacity or economic usefulness instead of chronological age:

One large public utility firm has recently proposed the establishment of a retirement panel for periodic consideration of each worker on the basis of "his capabilities, his service record, his physical status, his productive capacity, and his value to the company. . . ."

A manufacturing concern in a fairly heavy industry is already operating a panel which includes representatives of management and of the union, and, for a time, the employee himself. At each year from age 60 through age 67, the individual's status is reviewed with him and he stays or retires according to the consensus reached. From age 68 through age 71 the decision is reached between the company and the union; at age 72, by the company alone. This plan has real flexibility and is said to be quite satisfactory in meeting the interests of all concerned.

Another manufacturing plant has a flexible retirement program and also permits the worker to come out of retirement if he finds that he doesn't like it and is able to work as much as two days a week.[5]

These are mere beginnings but they are promising ones, indeed. If they are more widely extended and if they are studied by personnel people, industrial physicians, industrial psychologists and others, they should yield rich information that will serve the well-being both of the individual and of society as well.

Even continued employment will result in eventual separation for most workers. Another field just being explored is that of preparation for retirement. One Conference delegate said, "Abrupt retirement is a death sentence to large numbers of old people, and a sickness or morale breakdown to many others."[6] It is too early to say what form pre-retirement programs will take, but current projects include periodic physical examinations, with suggestions as to health maintenance, counseling regarding avocational interests and living arrangements, and courses designed to give information on living in the later years and to stimulate interest in leisure time activities. Industrial physicians who fall into the category of public health workers are involved in most of these programs.

LIVING ARRANGEMENTS

The well-being of the individual at any age depends upon his ability to satisfy his total needs in socially acceptable ways. Our present knowledge indicates that basic needs do not change with age, although the means of satisfying them may. It has been observed, though not scientifically demonstrated, that older people denied *raison d'etre* are apt to die earlier than others. Psychiatrists point out that those whose thoughts are completely self-contemplative quickly go into a state of retrogression. Psychologists cite the law of

exercise regarding the preservation of mental functions.

It seems clear that if we are to achieve good adjustment to aging, we must have opportunity to participate in a wide variety of activities, including gainful employment or avocational occupations; educational experiences that will keep us alert and informed; recreation, health services, and community activities that will enable us to satisfy our needs for recognition, companionship, physical comfort, activity, emotional security, and religious experience.

This area can be approached through a number of avenues. For the present discussion, I have chosen that of living arrangements. This is much more than a matter of physical housing, although that is an important part of it.

Most older people seem to wish to live in their own homes. Though the matter has never been fully investigated, it appears likely that they enjoy the continued status of independence, the self-management and privacy, and, perhaps, the feeling of emotional security derived from familiar surroundings. It is natural that they should like to be near long time friends, near children, if possible, and near shopping centers and familiar institutions. At the same time, maintenance of the home must be feasible financially and in relation to declining physical capacity. For many older people, the home should be on one floor and should be as free as possible from health hazards.

Many older people can live alone in their own homes quite satisfactorily and apparently quite happily. Others could live independently if small, inexpensive, properly located homes were available to them. One city buys small homes as they come on the market and makes them available to older couples for as long as needed. There are one or two places where private philanthropy has built separate dwellings for older people. In the United States, however, this remains a great, untouched field. It probably will remain so until it is recognized that the field is one for non-profit or low-return development, or for actual subsidy.

Availability of health services and sometimes housekeeping assistance would make it possible for many more older people to continue in their own homes. One British study has shown that a good many older couples get along quite satisfactorily, even during periods of prolonged illness when medical care is at hand, when it is possible to have at least one good meal each day, when relatives and friends come in, and when the physical task of maintaining the home and caring for the sick spouse is not too great. It seems to me that the hospital-home care plan has much to offer in this regard and that the foreign experiments in providing household help and prepared meals should be observed more closely.

The next solution to the problem of living arrangements lies in what may be called semi-congregate facilities. Voluntary doubling up, initiated by widows or by couples with large homes for which the family has grown too small, is not unknown. The foster home plan for placement of single older people or even couples has yielded favorable experience. In my opinion both these plans are worth while from the point of view of meeting individual needs but neither will come into wide usage until there are community facilities for making the possibilities known to those who have the homes and to those who need them.

An arrangement similar in some respects would be the construction by municipal authorities or private, nonprofit agencies of small, centrally located single- and multiple-dwelling units with central dining, recreational, and perhaps infirmary facilities. Residents could retain many of the advantages of independent community living, but also have

the services essential to them as aging persons. I firmly believe that the community that develops this idea will be richly rewarded and widely acclaimed.

These latter proposals bring us to consideration of bona fide group living. This occurs in a variety of forms and will continue to do so because of individual differences and preferences: homes for the aged, infirmaries, nursing homes, and geriatric hospital facilities. None except the last-mentioned represent a new idea but all are coming into review in the light of our recognition of what older people need and want.

Such facilities will be necessary for those who require continued medical supervision and for those who are unable or do not choose to live otherwise. The principal criticism of these so-called homes is that many of them offer nothing more than a vegetative, self-contemplative existence. Many of our county infirmaries crawl with vermin, medical neglect, and boredom. At the Conference on Aging it was urged that standards be established for such places, recognizing the interests of older people in varied activities and community pursuits. It is finally becoming recognized that congregate living quarters should *not* be set off in rural, isolated locations.

Delegates to the Health Maintenance Section of the Conference urged the establishment of geriatric diagnostic, health counseling, and hospital facilities —not separately, but in connection with general hospitals and medical teaching centers. Considerations are health promotion, early detection of illness, availability of full hospital facilities when needed, opportunities for research and teaching, costs below those of full hospital service, and the development of restorative services.

Even though communities may not be ready to undertake action programs, they can begin to survey the living arrangements and needs of older people.

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A Community Mental Health Program*

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A MENTAL health program is now recognized as an integral part of the total health program for a community. The experiences of the Selective Service and the Armed Services in the recent war proved that mental health cannot be the exclusive responsibility of the individual or his family, but is a public health problem. As in all health programs, a community mental health program must fit the needs of the people whom it serves.

Before we can discuss a community mental health program, two basic questions must be considered. The first question is, "What is mental health?" An individual in a good state of mental health is one who is reasonably comfortable within himself and with his environment and who follows the accepted behavior patterns of his culture. He is thus able to function efficiently in his personal, social, and vocational relationships and responsibilities.

It was long ago recognized that the state of health of an individual in a group was a matter of concern to all members of that group. So it is now recognized that the mental health of an individual is directly related to his efficiency on the job and thus to the productivity of his office or factory; it affects his ability to carry on the responsibilities of his family; it has direct bearing on his acceptance of the rules and patterns of behavior of his community. The degree to which his mental health is impaired determines how much of a problem he may present to his community, but, whether major or minimal, the problem remains a responsibility within a public health program.

This leads to the second question, "What are the goals of a mental health program?" Ideally, in every public health program the goal would be a state of perfect health for every citizen, but practically, the goal has to be concerned largely with his effective functioning. In a program dealing with vision it is not the aim that each individual should achieve perfect 20–20 vision, but rather that those defects which are interfering with his performance at his job or in school shall be so corrected that he no longer works under a handicap. Similarly in a mental health program the aim is to make available to individuals the necessary services for evaluating and treating the emotional difficulties which interfere with their effective functioning in the home, at school, on the job, or in the community. Such a program cannot be expected to reach every individual nor to solve every problem.

It has been some comfort to psychiatrists to read a recent statement that if every dentist in the country began working on the East Coast with the existing population who need dental care, it would take them 85 years of examination and treatment to reach the West Coast. If this be true, it is obvious that those interested in mental hygiene are not the only ones facing a huge problem.

In the field of mental health, as in every other public health field, the chief

* Presented at the Annual Meeting of the Pennsylvania Public Health Association in York, Pa., October 19, 1950.

area for concentrated attack is in the prevention of illness. In a public health program our chief concern is to keep a well baby well and to keep a well adult healthy. To accomplish this we are interested in inoculation and vaccination, in sanitation, in frequent and early health examinations, and in education. Although our chief concern is in preventing the disease from developing rather than in treating it after it has developed, the latter is not lost sight of in any public health program. In a few diseases we can treat the illness, control the vector, and prevent the individual from developing the disease even when he is exposed. In other diseases, notably polio, we are using all available information on a rather empirical basis, realizing that we have no effective means of control at any one of the three points.

Emotional disorders are in every way comparable. In certain situations we have learned the cause-and-effect relationship but in others we are going on observation and using empirical methods in the absence of more definite information. Neither in polio nor in psychiatric disorders does this lessen our responsibility to make use of all information now available and to remain aware of the possible development of new methods at any point in our program. A great deal of knowledge is now at hand in the whole field of psychiatry and mental hygiene and to delay using this until complete knowledge has been gathered would be comparable to delaying treatment of a child with polio simply because everything is not known.

A community mental health program must encompass three specific areas. First, there is need for the treatment of those who are already ill. Such a program includes hospital care for the seriously disturbed or psychotic individuals and the outpatient clinic treatment of the ambulatory cases. There are numerous reasons why such services are necessary. The care of one seriously retarded child may affect the mental health of the total family by interfering with the effective functioning of the father on his job, preventing the mother from giving other children in the family full care and attention, resulting in neighborhood difficulties over the behavior of the retarded individual, affecting the social life of the growing children, and being a constant drain on the family finances.

The same may be true when a member of the family is psychotic. When the patient is one of the adult and responsible members of the family, the effect upon the individuals in the home may be even greater. The necessity for outpatient treatment facilities for the seriously disturbed psychoneurotic individuals, who are in danger of losing jobs or being unable to care for their families if the condition persists, is self-evident. Another important aspect of having treatment facilities available is that community acceptance and participation in any health program are largely dependent upon the community's seeing some gain to the individuals in the community as a result of the program. To expect a community to accept on faith the wisdom of the "experts" in a long-range health program is to be naive about communities. When, however, they see the practical value of the program and learn by experience that the experts know what they are talking about, their support is sure.

The second need is for counseling services for the people who are being hampered by the worries and strains of everyday living. It is recognized that many people in a community serve as counselors in time of trouble. It is also true that in many instances individuals have no place to turn and may for long periods of time endure strain and worry which an interview or two with a responsible individual could prevent. There are the young married people con-

cerned over problems of adjustment; there are the young parents with many questions concerning the details of dealing with their growing children; there are the men and women who feel worried or inadequate on their jobs; there are the children who are making poor progress in school; and there are the individuals in juvenile and adult courts who find social adjustment difficult.

This is a pattern of preventive service which has been followed in the well-baby clinics, the school health program, the prophylactic clinics and the cancer detection clinics. It is the recognition that there are many conditions which can be present in the normal and reasonably healthy individual which, if allowed to continue, result in minor or major states of ill health. Since it is true in psychiatry, as in all other medical specialties, that people go to a physician only when they are severely uncomfortable, the problems here mentioned are not ones which would ordinarily be taken to an outpatient psychiatric clinic.

The third need is for an informational service to make available to all citizens the accepted concepts of mental hygiene. Most of the material which has been presented in the past has been aimed at warning of serious mental illness and discussing needs of state hospitals, rather than directed at the preservation of good emotional health and the control of situations known to be conducive to the development of emotional disorders. The progress of a health program is directly related to the public's knowledge in that field. People must know where and why before they will be led. This is a new field in mental hygiene and there is much work to be done to increase knowledge and lessen fear.

As in all health programs, providing answers for these mental health needs is not entirely within the province of a health department but, since it is a public health problem, much of the work can be initiated there. Even when the community is aware of the need for these three types of service, the question arises as to how such a program can be incorporated into the organization of the community.

1. *Treatment Clinics*—A psychiatric treatment clinic is essential to each community. As in every other type of program it cannot be expected that every case needing treatment would either be willing to attend such a clinic or will necessarily be found at once. The recent popularity of child guidance clinics is merited, but in addition to this it is important to recognize that emotional illnesses of adults have direct effect upon children and upon the community. It is therefore essential that facilities be available both for adults and children. Some preliminary survey of the need for treatment services will allow a clinic plan tailor-made to the community. In most instances the use of a psychiatric clinic increases rapidly and because psychiatric treatment is time-consuming, a waiting list soon develops. This can be considered proof of the need for and acceptance of the program.

2. *Counseling Services*—A mental health counseling program would be best handled as a part of existing agency services rather than a separate and distinct service, since having personnel experienced in mental health problems allows each agency to incorporate mental hygiene concepts into every phase of its program. Within the clinics of the health department and through the home visits made by the public health nurse, a great deal can be done. The well-baby clinic and the prenatal clinic offer a fertile field for a program of group discussions wherein the individuals are allowed to talk rather than having someone lecture to them. It is amazing to discover that the problems which people actually have are often not the ones which we have supposed they would have. In addition to this, there can be opportunities for individual consulta-

tions and referral to a psychiatric clinic when this is desirable. Within the school system there is the opportunity for the establishment of psychological clinics to deal with the problems of educational and vocational adjustment and to serve as a means of recognizing severe emotional problems which should be referred to psychiatric clinics for therapy.

Another area in which a counseling program can be of value is within the courts—the juvenile court, the family court, the adult court. Here a counseling service may make such an experience a constructive rather than a destructive one and make it result in a lessening of antisocial attitudes, particularly of many of the adolescents who appear in court. Here again referral to a psychiatric clinic would be possible when further study and treatment was indicated. Although many large industries have personnel counselors and are aware of how greatly tension and worry in the individual affects his industrial efficiency, a community mental health program must also take into consideration the particular problems which industry presents.

3. *Informational Services*—Health is never an exciting subject and since it must always be a long-range program it is often difficult to make it seem worth time and attention. It has taken a long time to bring people to recognize that care of a child's baby teeth is important. Even now the public health nurse and the dental hygienist often meet the statement, "The baby teeth will come out anyhow, so why bother to take care of them?" When such attitudes can persist despite a program as widely publicized as dental hygiene, it is easy to recognize that there is a long way to go in the field of mental hygiene. In addition to the pamphlets and audiovisual aids which are used with community groups, it is important to reach those who will have a part to play in determining the attitudes of the community and particularly of the children. So, in addition to health educators including mental hygiene in their program, it is important that nurses and teachers have mental hygiene incorporated into their inservice training programs. Such programs should concentrate more on health and the factors which go toward preserving mental health than on abnormal patterns of behavior. Only by widespread knowledge of the factors affecting personality development and emotional health can progress in preventing emotional disorders be made.

A community mental health program must be a preventive program aimed at preserving the health of the individuals of the community by teaching them the principles of mental hygiene, by making the community aware of factors which are inimical to the mental health of the community, and by dealing with existing psychiatric illnesses. It is a program dependent upon community understanding and coöperation toward the end of better health for each individual.

Home Accident Prevention*

A Research Program

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IN 1948 the Kalamazoo City-County Health Department, having recognized home accidents as an important public health problem, began giving serious consideration to the possibilities of including home accident prevention work as a part of its regular public health activities. An attempt to find tried and proved programs and techniques that had been studied and evaluated, and that would possibly fit into a health department's program, seemed to indicate that such research had not as yet been satisfactorily done in the home safety field. The need for such research was so apparent that we decided to attempt it ourselves.

On January 1, 1949, the department, with financial support from the W. K. Kellogg Foundation, began a three year research program on home accident prevention.

This department serves Kalamazoo City and Kalamazoo County, which have a combined population of approximately 126,000, about equally divided between city and rural. It adopted five major objectives in its research program. These were:

A. To demonstrate the possibility of effecting a significant reduction of mortality and morbidity caused by home accidents.
B. To define the most practical and most effective scope of activity for local health departments in home safety programs.
   1. To analyze the circumstances and causes of home accidents.
   2. To determine training desirable for public health personnel participating in a home safety program.
   3. To determine the function of the various professional groups in a health department.
C. To develop an awareness in the community as to the need and value of a home safety program.
D. To experiment with several activities and techniques not previously attempted in this field.
   1. To develop and evaluate educational methods in the home safety field.
   2. To evaluate the effectiveness of the various techniques and determine the cost of each.
E. To explore the contributions that can be made by various official and volunteer agencies of a community and to demonstrate how these agencies can be coördinated.

All our efforts are directed at, and are secondary to, accomplishing our first objective. The others assume importance in proportion to our ability to demonstrate a significant reduction in home accident incidence.

As a base line for evaluating our program, we have reviewed all county death certificates for the past 16 years and determined as accurate a home accident death rate as is possible. In addition to our mortality rate, we are attempting to determine the morbidity rate. Annual arrangements have been made with the school census enumerators to survey home accidental injuries which had occurred between January 1 and May 1. This survey covers about 60 per cent of the estimated 34,000 homes in the county. In addition to the number of home accidents that had occurred, the names and addresses are reported, and

* Presented before the Subcommittee on Accident Prevention, Committee on Administrative Practice of the American Public Health Association at the Seventy-eighth Annual Meeting in St. Louis, Mo., October 30, 1950.

epidemiological studies are made on each reported case to confirm the report and secure data concerning the circumstances and causes of local home accidents.

These epidemiological investigations should prove of value in helping determine the most practical and effective scope of activity for a local health department. The facts we obtain, plus such research data as are obtainable, are being accumulated for statistical study and evaluation.

Staff training has been a continuing process. It began in division head staff conferences. Consultants from the National Safety Council, U. S. Public Health Service, and W. K. Kellogg Foundation participated in several of these. A six hour conference and training course on home safety was then held for all our health department staff members. This consisted of movies, slides, and talks on the various aspects of home accidents, by the medical director, fire chief, two safety engineers from the Consumers Power Company, and a senior sanitation engineer from the U. S. Public Health Service. These talks were followed by group discussion. Subsequent to this, we have had numerous individual and several group conferences at the division head and staff levels.

Recently a staff workshop was conducted on: The Scope of Activity for Local Health Departments and the Function of the Various Public Health Groups in Home Accident Prevention. This was followed by specific program planning in division staff conferences. Other such workshops are scheduled to follow.

Additional attempts to acquaint the staff with the extent and nature of the problem and to stimulate interest and action in home accident prevention have been made through the use of provocative questionnaires; the preparation and use of a technical library consisting of pamphlets on home accident facts, programs, forms, survey sheets, etc.; and through total staff participation in the problem study, program planning and individual participation in the home safety program.

Each professional staff member is encouraged to enrich his or her present home visits by including something on accident prevention and by using existing circumstances to give motivation for action by the individual. For instance, in teaching a mother how to bathe a new baby, many routine safety items are included such as correct temperature of water, good technique and care in handling, care of safety pins, etc. In the past, many conferences stopped here. The nurses are now endeavoring to use this teaching opportunity to caution about rugs on a slippery floor, the danger of children eating grandmother's medicine, poison dangers, fire hazards, or the possibility of elderly persons falling over toys and pets with danger to themselves. The point is often made by relating the story of accidents known to us which illustrate the nature of the hazard noted.

Prevailing conditions are used to give emphasis to the importance of personal precautions. For instance, there is need for greater precaution on the part of diabetics, inasmuch as they are more likely to have serious complications following a home accident. Likewise, pregnancy is used as an opportunity to motivate correction of accident hazards, which protects the mother but also protects the whole family; for example, elimination of non-anchored rugs on slippery floors, repair to steps, installation of a handrail on stairs, better lighting, etc. The nurses report that this kind of teaching is accepted, as well as other types of teaching we do. Where more serious hazards are observed, such as gas leaks, return visits are made to determine whether recommendations have been followed and the hazard corrected.

Our efforts to develop community awareness as to the need and value of a home safety program have been coupled with our safety educational efforts. These efforts have helped demonstrate the contributions that can be made by various agencies and how these can be coördinated. This phase of our program has been conducted as a series of projects. Each of these has been set up in three specific steps: the *objectives* that we wished to accomplish; the *procedure* to be used; and the *evaluation* of the project. This has been done to enable us to evaluate better educational methods, and the effectiveness and cost of each.

The promotion of a Home Safety Week was our first big effort for stimulating community awareness and enlisting actual participation by persons in their homes. Upon our request, the City Commission authorized the mayor to proclaim certain dates as Home Safety Week. The press and radio readily agreed to give us full coöperation. It was decided that a mass distribution of materials, which were both informative as to the new project and instructive as to how a home could be made safer, would be conducted. This gave us the opportunity to bring into the program the Boy Scouts, the Girl Scouts, and the faculties and student bodies of the public and parochial schools. Twenty thousand packets, including materials pertinent to greater safety in the home, were assembled and distributed. Movie trailers were made and shown in Kalamazoo's five theatres for the entire week. Spot announcements were written and used during the week on our radio stations. Special articles and news releases with pictures were printed by the newspapers. Exhibits were used, along with window posters.

One month after Home Safety Week, 200 homes were picked at random and surveyed in an attempt to evaluate community awareness and to determine whether persons had done anything to make their homes safer. Our evaluation revealed that of the approximately 34,000 homes in our county, over 60 per cent were aware that a new home safety project was starting in Kalamazoo and some person in 27 per cent or 9,000 homes had followed some of the home safety suggestions recommended in the packet. The two things most frequently mentioned were a general cleanup of basements and stairways, and repairs made to porches and steps.

An Annual Home Builders' Show has given us an opportunity to urge people to "build for safety." A booth featuring actual plans for the building of a safe home, along with other posters and booklets, was sponsored by the Health Department.

Another project, promoted in coöperation with the County 4-H Club Agent, was held in conjunction with National Farm Safety Week. It consisted of a contest in two parts. Part one was to award each 4-H Club member a ticket to "fun night" if he obtained a signed statement from his father and two neighbors that they would remove or correct as many safety hazards as they could find on their farms. Four General Motors dealers contributed $100 to make the 4-H Club "fun night" possible.

The second part of this project was organized in such a way that each 4-H Club member turned in, in writing, the number of safety hazards that had been removed or corrected. This, again, was a signed statement by the parent and neighbors. Each hazard that had been corrected counted ten points, and the total was divided by the number of members in each club. Three cash awards of $100, $50, and $25 were presented the clubs with the highest scores. This money was contributed by seven local farm implement dealers and was used by the clubs to help build a 4-H Club exhibition building at the County Fair grounds.

The public school systems were interested in expanding and improving their health and safety teaching. Health department personnel worked with a committee of teachers to develop a school curriculum guide which insures educational units for all students on home safety as well as on all aspects of health and safety.

Two safety charts were purchased and loaned to the city and county schools on an indefinite loan basis. These charts proved so stimulating to the Kalamazoo school system that nine more were purchased by the School Board.

A puppet show which acted a specially prepared recorded safety play was made and displayed at the County Fair. Later it was loaned to several schools which used it in teaching health and safety.

A Safe Christmas Campaign was sponsored last Christmas. The fire departments distributed 10,000 "Safe Christmas Tree Tags" to all Christmas tree dealers, who in turn fastened one to each tree sold. Spot announcements urging people to have a happy and *safe* Christmas were used over both local radio stations. Questions on safety were prepared for and used on three regularly scheduled radio quiz shows.

One of our largest projects from the standpoint of numbers participating was started January 1, 1950 in coöperation with the city and county PTA's. This project was an attempt to place 10,000 safety packets in homes of our community and to elicit participation in our accident prevention program by as many as possible. A home safety calendar was included in the packet, along with complete instructions on how the PTA project was to operate. Each PTA member was asked to survey his home for safety hazards once a month for a period of four months, and to record all home accidents during that period. This survey was to be made on a check list provided. The survey and accident report was to be sent to the Health Department each month.

We used the technique of asking for assistance from the family in the home in order to make our community safer. The project was conducted as a contest, and another appeal was made to coöperate and help win an award for their PTA. Our distribution of packets and the return of reports was made possible through the coöperation of the school children and the teachers.

An evaluation of this project indicated that packets went into more than 7,000 homes and, as the materials were scored upon being returned, it was possible to make a tabulation which showed that over 4,000 homes participated.

The Environmental Sanitation staff has developed and is experimenting with an inspection and grading form on sanitation and safety for homes. It has been used for staff training and we are now starting to use it for inspection of private homes as a public health service, upon request.

Parents of each new baby in the county are being sent *Safety Suggestions for Baby* as soon after birth as possible. At six months, we check to see if they have had an accident and remind them of needed immunizations.

When we started our home safety efforts, we were searching for programs and techniques that would possibly fit into a health department's program. Now we see more than we can do. Currently we are trying to develop a project designed for organized groups of older people to prevent accidents among the aged. Safety bulletins for the professions have been collected and distributions started. A slide series has been started. A collection of household safety equipment has been initiated. We are trying to promote a builder to build the perfect house from the safety standpoint.

Our research efforts are less than two years old and it is too early to draw any conclusions. We are encouraged, how-

ever, by the possible significance of a drop in our home accidental death rate during the period of time the project has been in operation. During our first year, 1949, our home accidental death rate dropped from a 15-year average of 27.2 to 21.0, which was one of the lowest annual death rates for this community, though slightly higher than the national average.

In order to compare this year's home accidental death rate with the national average, and with that of the past 15 years, as previously mentioned, we used both the old and the new classification of home accidental deaths. The national figures indicating annual home accidental death rate, based on the first six months of this year, have recently been released by the National Safety Council. The new classification of home accidental deaths has been used. This rate is 19.5. The home accidental death rate for this community, based on the same classification of death certificates over the same period of time, is 12.6. The old classification, at the end of the first nine months of this year, indicates that our annual home accidental death rate will be 13.7, which is comparable to the past 15-year average of 27.2. If we are fortunate enough to complete this year with our indicated home accidental death rate of 13.7, it will be the lowest home accidental death rate ever recorded in this community.

ADDENDUM

Since the writing of this paper, we have completed several additional months of activity and have had more time for a complete statistical study of the first two years of our program.

The following is a complete statistical review of the two years of the Kalamazoo Home Accident Prevention Program:

15 year average home accidental death rate, prior to 1949	27.2
Home accidental death rate for 1949	21.0
Percentage of decrease for 1949, from 15 year average	23.0
Home accidental death rate for 1950	13.5
Percentage of decrease for 1950, from 15 year average	50.4

A door-to-door home accidental injury survey, covering a population of 46,000 persons in this community during 1949, showed a ratio of 110 injuries for every home accidental death.

A door-to-door home accidental injury survey in 1950, covering a population of 83,000 persons in this community, showed a ratio of 109 injuries for every home accidental death.

Based on this ratio, the home accidental injury rate was reduced 23 per cent in 1949 from a previous 15 year average, and 50 per cent during 1950 from a previous 15 year average.

Based on the National Safety Council's estimate of a $130 cost for each incapacitating home accident, the total savings for 1949 and 1950 in Kalamazoo County because of the reduction in home accidental injuries was $282,000.

Another point of interest is that during the 15 years prior to 1949, Kalamazoo County's home accidental death rate averaged 9 per cent higher than the national average. At the end of 1950, the home accidental death rate had been reduced to 44 per cent below the national average.

At the end of June, 1951, Kalamazoo County has again established an all-time low home accidental death and injury rate for the first six months of any previous 17 years. It is of course much too early to know what the rate will be on December 31.

Home Accident Prevention*

The Home Safety Program of the Los Angeles City Health Department

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IN March, 1946, the Los Angeles Health Department began to take an active interest in the problem of home accidents. It was obvious that a health department, due to the nature of its organization and functions, could logically undertake the initiation of a home safety program, although the program's development would have to be confined to the use of existing facilities in its everyday services to the public. Justification of these life-saving activities through a safety program was the more evident when it was realized that so much of the disease prevention work of the Health Department was nullified by disability or death of those whose lives were saved by preventive medicine. Field staffs, normally going into homes and business establishments and in close contact with the people on an informal teaching basis, form a natural link between a health department and the public, while the departmental educational facilities, such as pamphlets, films, exhibits, and lectures, lend themselves admirably to the promotion of home accident prevention. Furthermore, certain divisions of a health department (housing, pest control, sanitation, etc.) have the responsibility of enforcing not only health and sanitation laws, but also closely related safety measures.

As a result, it was decided to accept the challenge of initiating this safety program despite practical difficulties such as lack of funds for expansion of personnel and visual aid facilities. Furthermore, our thinking was influenced by the fact that the U. S. Public Health Service and the American Public Health Association had been urging for some time the need for undertaking the pioneering of such a safety program. The example of a few leading state health departments, the New York State Department of Health in particular, gave us much needed confidence to proceed with the task.

The program started slowly, due to the difficulty of integrating it into the accepted field of public health work. It was natural that the department's personnel, particularly on the supervisorial levels, were reluctant to add another program to their already overburdened schedule. It took patience, tact and ingenuity to overcome this passive resistance. And here I might publicly express my thanks to my chief, Dr. George M. Uhl, Los Angeles City Health Officer, for consistently supporting the development of this program despite frequent criticisms on the part of individuals who just could not see what safety had to do with health and why a health department should get involved in this newfangled project. I am happy to say that these initial difficulties are behind us and that the program (four years later) is automaticallly accepted as an integral part of our department's activities.

Realizing that we could not hurry its acceptance, we spent the next two years (1946 and 1947) in the development of the program among our own personnel. Home accident prevention classes of the American National Red Cross were given, in which doctors,

* Presented before the Subcommittee on Accident Prevention, Committee on Administrative Practice of the American Public Health Association at the Seventy-eighth Annual Meeting in St. Louis, Mo., October 30, 1950.

nurses, sanitation inspectors, and members of the clerical staff participated. These graduates carried the message of home safety to their coworkers, families, and the public they contacted in the course of their daily work.

A Health Department Safety Committee was formed, whose efforts were directed toward elimination of building, fire, and office hazards and the development of safety awareness among the members of the department. For the purpose of carrying the safety message to other city departments, a safety column was inaugurated in June, 1946, in the monthly publication of the Los Angeles All-City Employees Association; this magazine reaches over 12,000 employees and through them their families and their communities. The column is now in its fourth year.

The recording of home accidents was undertaken by our public health nurses whenever on routine home calls. These home calls are also used by the nurses for the indoctrination in home safety of the families visited, and through them, of the community. The Child Health Division initiated short talks by the department's nurses at the weekly "Well-Baby Conferences," at which mothers were given simple advice on home accident prevention. The Nutrition Division participated in this activity, principally stressing kitchen safety.

The Industrial Health Division undertook the conditioning of industry on the importance of prevention of home accidents, while the Bureau of Housing and Sanitation used the facilities of every one of its divisions to promote the safety program. Of special importance was the inclusion of kitchen safety in the food handlers' course; pre- and mid-summer basic indoctrination in first aid and field accident prevention of mosquito control crews; and presentations of swimming pool safety at spring seminars for pool owners and operators, held yearly under the auspices of the Sanitation Engineering Division.

A series of home accident prevention posters and charts were prepared early in July, 1946, and since have been added to and displayed on a monthly rotation basis in District Health Offices. A conservative estimate places the number of people who view them over a period of one year at 150,000.

While these activities were being developed within the department itself, it soon became apparent that community participation was essential to the success of this undertaking. Close coöperation was gradually established with such organizations as the American National Red Cross, National Safety Council and other safety councils, women's and youth groups and service organizations, PTA's, schools, churches, and others. But it was not until June, 1948, that agencies actively engaged in safety promotion recognized our efforts in the home accident prevention field. At that time we were invited to present our safety program before the Home Safety Section of the Western States Safety Conference, held that year in Los Angeles. It was the beginning of nation-wide recognition for our program.

Time does not permit the enumeration here of the great variety of projects that comprise our department's home safety program. However, we shall be happy to make available to all those interested our outlines, tables, studies, lecture material, articles, etc., upon request.

While all safety activities mentioned previously have since grown in scope and are important *per se*, certain of the projects should be highlighted. In December, 1948, a statistical study was made of data collected by our City Receiving Hospitals of non-fatal accidents to children between the ages of under 1 through 15. This preliminary study brought out an interesting fact (among others), that the accepted ratio of 100 non-fatal accidents to 1 accidental death

was extremely low. Actually the ratio in Los Angeles was 231 to 1 and would be higher if hospitals, clinics, private physicians, and others were included. We are at present working on a second study of non-fatal accidents in the same age brackets, for which data were collected in July of this year. Another statistical project recently started is a monthly report of the city's accidental deaths, which compares figures of home-area fatalities with those of traffic, industrial, and others. These data are taken from the photostatic copies of death certificates as held in our Vital Statistics Division and are made available to approximately 30 agencies interested in the promotion of safety.

A second safety column, specializing in baby safety, has been appearing in a monthly newspaper for over two years. A weekly 10 minute television program on home safety had a five month run and was discontinued only because of the impossibility of fitting it into our summer working schedule. Incidentally, our weekly 15 minute radio broadcast on home safety, a series of informal interviews, comments and advice, is in its second year, and we have just made a television commercial on the major hazards of hot weather months. In addition, a number of seasonal safety sketches were presented on radio and television throughout the past two years.

Since February, 1949, we have been serving on the Board of the Home Safety Division of the Greater Los Angeles Chapter of the National Safety Council. The climax of our participation in their program was our sponsoring the month of July as the "Hot Weather Hazards" month. We have available a complete report, together with a series of safety leaflets, on the step by step development of this project. This year's Second Annual Safety Breakfast, a highlight of our July Safety Month, was held in the restaurant of the Los Angeles City Hall and was a particularly successful demonstration of our department's accident prevention program.

Even before the start of the home accident prevention program our relationship with the American National Red Cross had been very close, and we are particularly indebted to Dr. Carl J. Potthoff, National Director of First Aid and Associate Medical Director of the American National Red Cross, for his whole-hearted coöperation. One of the highlights of this relationship is our serving on the faculty of the Annual National Accident Prevention School of the American National Red Cross held near Carmel, Calif. The course, presented by us for the last two years, covered "Coordination of Community Safety Planning" and its outline and charts have been widely distributed as the result of inquiries from community leaders throughout the country.

At the request of the Federation of Community Coordinating Councils of the Los Angeles City and County on whose Advisory Safety Committee we serve, we prepared a special Community Organization Guide for the use of their safety chairmen, as well as a source material pamphlet. Numerous organizational meetings were being conducted by request throughout the city and county, principally after business hours and on week-ends.

A series of safety courses were developed and given before various organizations and agencies: Christmas Season Safety, a series of lectures at the Santa Claus School in Hollywood, which yearly trains professionals for department stores, club activities, etc.; a special home accident prevention course for expectant mothers in the Health Department's clinics; Home Accident Prevention—an in-office training program for our public health nurses; Safety Education of Baby Sitters—conducted in various parochial schools; The Principles

of Safety in Geriatrics—lectures given at the School of Public Health Nursing at the University of California in Los Angeles; and many others.

Looking back over the past four years, we cannot but feel pleased with the progress we have made in such a short time. True, much remains to be done, but at least a start has been made and we have established some basic principles for the successful development of this program:

1. Only existing departmental facilities should be used.
2. The home accident prevention program should not be the responsibility of the Health Education Division. The need for promotion of old, established health programs will handicap the development of the comparatively new safety program.
3. Studies of community attitudes, activities, and resources must be continuous.
4. Close coöperation with other groups interested in home safety must be developed for the sake of mutual aid and to avoid duplication.
5. Reference safety material must be assembled and made available to the department personnel, various agencies, students, and the general public. Mass distribution of free material should be avoided.
6. Visual aids should be used freely, preferably of the cartoon and comic strip type; window displays and simple exhibits are excellent.
7. The negative, "horror" approach must not be used.
8. While development of surveys, tables, and charts is essential to research, the use of figures should be held to a minimum when indoctrinating communities.
9. The resistance of government bodies controlling the appropriations for health departments must be overcome by a persistent campaign of selling the need for such a safety program. It can be done!
10. The key to successful home safety education is enthusiasm, patience and ingenuity.

In conclusion, several things should be noted: While civic and government leaders are convinced of the importance of an overall home accident prevention program in the community, the development of home safety consciousness presents peculiar problems. A careful analysis discloses that application of the education, engineering, and enforcement principles alone, so effective in controlling traffic accidents, is not enough. A fourth principle should be added—example. It is especially important where children are concerned.

Other difficulties are created by the elusive psychological factors of the problem as a whole: the emotional variations in individuals; the individual's wishful thinking that "it cannot happen to me, or in my home"; the understandable embarrassment of admitting even to oneself that slack home maintenance, poor housekeeping, slovenly personal habits, and inadequate instruction to children are responsible for most of the home tragedies; the daily proximity to hazards that are accepted as normal conditions in the home; the scarcity of effective weapons that would make possible forcible correction of these hazards; and the inadequate number of official agencies that would consider home accident prevention an integral part of their services to the public.

Furthermore, until people stop thinking of home accidents as something to be ashamed of and to be concealed; until they learn to want safe surroundings for the sake of their loved ones and themselves, despite additional effort, the civic-minded and safety-conscious individuals and groups, government and volunteer agency officials and others will be faced with a seemingly impossible task.

There is only one way in which this situation can be conquered and that is to accept it as a challenge. Avenues of approach are unexpectedly opening up. Obstacles seem to vanish. The deeper we delve into the intricacies of the problem, the more important becomes its solution. And the health department's place in this fight for safety is on the firing line among all those who believe that a safe and happy home is the bulwark of our democracy.

Stars To Steer By*

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THE health educator may be compared to the captain of a ship who sails under orders, with a full awareness of the predestined port and knowledge of the arts and sciences involved in steering the ship assigned him, as well as the ability to deal with the various human problems presented by his officers and crew. Tides, winds and weather will influence the navigator in his steering, but his goal is determined.

The goal of the health educator is the promotion of health for all people—our first star, a star of great magnitude, by which to steer.

There are now thousands of men and women serving professionally as health educators, and, in addition, education in health is practised by many thousands of others, by doctors, nurses, teachers and all public health workers. The cost of time thus expended can be estimated in millions of dollars annually. How has all this come about in a period which can be roughly estimated as 32 years?

About 1917, a new philosophy of health education was conceived, to the effect that knowledge about health and healthful living would not in itself result in practices which maintain health. The wealth of knowledge regarding health that was being brought to light by the scientific world was not affecting the lives of the people as a whole. This was true, although progress was evident in laws and regulations for health protection, such as pasteurization of milk, safe water supply, sewage control, infant care stations, immunization, vaccination facilities, etc. No *single* effort or activity was responsibility for the increased interest in health promotion through education. Many men and women were attempting to arouse the public to act upon the knowledge then available, but the effort took definite shape when a group of physicians at the New York Academy of Medicine in 1918 launched a movement to teach health to the people.

As is usual in this country of ours when a reform is undertaken, an organization was created to implement the concept. Prominent men and women from all sections of the country, representing medicine, public health, education, the biological sciences, psychology and the social sciences, as well as the national government, were invited to form a group to promote health through education. Twenty-five responded to a telegraphed request from a famous pediatrician, the late Dr. L. Emmett Holt, to join with him in an effort to improve the health of children. Thus was born the Child Health Organization of America, which, five years later, through amalgamation with the American Child Hygiene Association, became the American Child Health Association.

The term "health education" now on every tongue, was officially adopted in 1918 to describe this new branch of education.

Dr. Holt, as chairman of the newly formed Child Health Organization, announced that the efforts of the group would be directed first toward the chil-

* Presented before the Public Health Education Section of the American Public Health Association at the Seventy-eighth Annual Meeting in St. Louis, Mo., November 1, 1950.

dren in the schools, with a view of establishing desirable health habits at an early age and also with the firm conviction that children could influence the health habits of the family. This point of view seems commonplace today, but it was revolutionary 32 years ago. It was deemed a visionary project by many in the medical and public health fields, especially by those who believed that a thorough knowledge of anatomy, physiology, and the allied sciences was necessary to enable a teacher to instruct a child of school age regarding the simplest health habits.

At that time teachers left normal schools and teachers' colleges with little or no education in health, though physical exercises—calisthenics, mainly—had been introduced into school systems some years previously. A few nurses were at work in the schools, and medical inspection—as health examinations were called—was functioning in large centers and in some towns and counties, but teachers had practically no responsibility for that service and usually were not excused from their classes to be present during the examination of their pupils. School nurses knew how valuable the teacher could be to them in their efforts to secure corrections and to improve the health of the child, but the number of children assigned the nurse made it impracticable for time to be devoted to the education of the teacher regarding health, unless incidentally. Teachers, given no information from doctor or nurse, had no means of knowing the health needs of individual children or of understanding how to meet them.

Recognizing these facts, the decision of the Child Health Organization was to obtain health training for teachers. This was from the first a primary objective, but in the interval before it could be established, it was considered worth while to stimulate the interest of all teachers in teaching certain essential health practices. These habits were carefully selected, based upon the most authoritative opinion available at that time, and mention of *undesirable* living customs or habits was entirely omitted. The positive approach was adopted as being psychologically sound, rather than the negative one usually used at that period. "Don't eat green apples" was replaced with "Eat some fruit or green vegetable every day." "Don't stay up late" was changed to "Sleep long hours with windows opened wide."

Enormous printings of these so-called "Rules of the Game" were distributed, together with one brochure specifically for teachers. Since the first World War was still in progress, the title selected was related to national service: *Wanted —Teachers To Enlist for Child Health Service*. The first edition was soon exhausted, because of good publicity as to its availability. An invitation to teachers to send in the results of their efforts to teach these few health habits resulted in an avalanche of material, much of which became the basis for other publications for teachers, to be issued both by the C.H.O. (as it was popularly known) and the U. S. Bureau of Education, now the U. S. Office of Education. One item sold in the millions through the U. S. Department of Documents, which broke all their sales records to that date! *This* proved conclusively that teachers *were* interested in teaching health.

Printed matter was only one phase of the program designed to teach good living habits for all children. The press coöperated fully, and information about balanced diets, hygienic living, health examinations, correction of physical defects, school lunches, hand washing facilities in schools, etc., was broadcast through a gifted publicist.

Dramatic methods of awakening the people were instituted, and though these caused some criticism, the authorities in health and in education sponsoring the program were of such importance

and the results obtained so good that soon there was a rather general acceptance of the methods.

Through this entire period teachers were pounding at the doors of the Child Health Organization to know where they could go for courses in health. This stimulated the group to increase its efforts to obtain health teaching courses in colleges, universities, and normal schools. The late Dr. William Russell, Dean of Teachers College, Columbia University, agreed in 1919 to offer a course leading to a B.Sc. degree in Health Education. The first student to enter the course, in September, 1920, was Miss Mary Spencer, who had won a $1,000 scholarship offered by the C.H.O. The judges of the theses presented, who were members of the American Association of Teacher Training Institutions (now the American Association of Colleges for Teacher Education), were amazed that such a large number of teachers were concerned with health teaching. There is no doubt but that this one well publicized contest served to stimulate other institutions of higher learning to set up similar courses. Today, 30 years later, practically every institution preparing teachers offers courses in health education. In 1949 the U. S. Office of Education reported that more than 40 institutions offered a bachelor's degree in health education.*

The first program of graduate training for health educators in a school of public health was established at the Harvard-Massachusetts Institute of Technology School of Public Health in 1921. Professor William T. Sedgwick, who was head of the Department of Biology and Public Health at M.I.T. had been very sympathetic to the experimentation which Dr. Clair E. Turner had begun in this field in the school year 1919–1920. When Dr. Sedgwick died in January, 1921, Dr. Turner took his place on the Administrative Board of the Harvard-M.I.T. School of Public Health. Upon his recommendation a one year program of graduate study in health education was established.

The next year Harvard established the Harvard School of Public Health with funds received from the Rockefeller Foundation and discontinued cooperation with the Massachusetts Institute of Technology. The Harvard School of Public Health decided not to train health educators, but the curriculum in health education started in the Harvard-M.I.T. School was continued at M.I.T. The men and women graduates from this course have performed signal service as pioneers in health education, both in this and in other countries.

So much for the background of the development of health education.

Though the movement was initiated as one to raise the standard of health of the American people as a whole, in the early stages the emphasis was placed on health improvement among school children. Through educational procedures it soon developed into one to educate the public, and so public health education was recognized as an imperative of health departments. In 1922, the Health Education Section of the American Public Health Association was created (five years later to become the Public Health Education Section). This group has been a tremendous force in setting and maintaining standards in health education. The School Health Section of the A.P.H.A., which came into being 20 years later (1942), has also served to advance school health programs.

Men and women throughout the country, in the period since the health education movement was initiated 32 years ago, have improved in physique and in general health, and while this is due to many factors—improved care in infancy, lessening of childhood diseases,

* *Institutions Offering Professional Education In Health Education, Physical Education and Recreation.* U. S. Office of Education, January, 1949.

greater medical knowledge, and increased facilities for medical care—health education has without a doubt made a definite contribution. However, this is not enough. Health behavior should be based on a respect for scientific health knowledge, and this can best be developed through the school, especially during the secondary school period—though, indeed, it should be begun in the early grades.

The science teacher is invaluable in creating a sound scientific background for the student's health behavior. Students can be taught and impressed with the fact that there is a body of scientific knowledge upon which it is intelligent to depend, but also that this changes from time to time, that what is learned today is not necessarily of value a year hence. Dr. E. V. McCollum once declared that the boy or girl who is led to question statements and seek the source can be expected to be the man or woman who will decline to accept unsupported statements.

We have not yet reached this goal. Health education has not yet sufficiently influenced the boys and girls who pass through our schools in such a way as to induce them to base their health behavior on scientifically accepted facts or to prevent their acting on statements from unreliable sources. This is equally true of the public at large, and until we have a public that has been convinced that there is a body of scientific fact that is not static but may change from time to time as new truths come to light, the goal of a nation of people who utilize current health knowledge cannot be expected. Dr. Stanley Hall has said, "We must not forget that there is a health sense with which some people are born that can be developed to some extent by training, and of which others show no trace through their entire lives, squandering health as the spendthrift does money."

One of our "Stars To Steer By" is training to create a desire and an increasing respect for the sciences upon which health is based.

Everywhere there is the danger of the gap between knowledge and practice. An oft-quoted example is that of the school child in the Philippine Islands who had learned about beriberi, what caused it, and how it could be cured, who had studied about it and filled her notebook with accurate information. But she died of that disease with the remedy at hand. Some emotional reaction, some liaison between heart and head—feeling and intellect—seems to be needed in order to bring about a change in behavior.

In the early days of health education the interest of the individual, whether child or adult, was accepted as an essential first step in influencing health behavior, and all plans were made with interest as the cornerstone of motivation. For the little child, to please or win approval is often sufficient inducement; for the older children, strength and skill in sports appeal to boys, as does the quest for beauty to girls.

Advertisers are well aware of the importance of interest, and are skillful in inciting and maintaining it. Health educators are also aware of it, yet often fail to grasp the interest of the individual after it has been created and thereby lose much of the effect of their effort. To give an example: Radio programs always result in inquiries from the public, who telephone or write for more information. These present a distinct opportunity, yet such inquiries are often neglected by the official or nonofficial group sponsoring the program. This seems to be due to insufficient forethought. Advance planning is essential if the full value of a radio program is to be obtained. Correspondence is expensive, but no inquiry should go unanswered. A simple folder or inexpensive leaflet covering the subject discussed can be utilized if personal letters are impracticable.

Another "Star To Steer By" might well be to increase curiosity regarding health on the part of the public.

An example of our failure to satisfy the curiosity of individuals *on their intellectual level* is brought out in a significant study made by Pauline Hobbs * in 1948, to determine the adequacy of responses that state health departments were making to requests for information received from educated and uneducated lay persons living outside their own states. Identical sets of questions, one literate and the other illiterate, were sent to 47 states. A large proportion of the 29 states sending materials in response to each request made some effort to adjust their replies to the educational level of the inquirer and some of these were evidently prepared to meet the needs of children and uneducated adults.

In the materials received, there was an indication that much of the information now distributed to semiliterate people may be above their reading level.

The number of men and women who request information from state and national health groups indicates that there is a growing respect for health facts, but their number can be greatly increased.

Do the results justify those who in the early days dreamed dreams which envisioned a nation free from unnecessary physical impairment—those who thought they were setting their sights by the stars? Has disease been prevented and life enriched sufficiently to warrant the confidence placed in us as health educators by those who use tax money to include an item in the budget for health education?

Yes, we believe so.

We believe that some, at least, of the many advantageous changes in the daily living of the people can be credited to the influence of health teaching. Some of this may be indirect, for the principles developed and the methods evolved by health educators in their effort to affect human behavior are often utilized by those whose motive is quite foreign to health promotion, but they still serve their original purpose. There is scarcely a reliable commercial firm today using a health appeal which does not obtain professional advice in the preparation of its program and in the development of copy. Writers of books, too, are careful to seek authentic facts in referring to any phase of health. This has come about through the infiltration of health education into the lives of the people, many of whom react unfavorably to erroneous statements concerning health.

One more "Star To Steer By" is to gain a whole populace who will accept only publicized statements that are based upon well authenticated facts.

A sign of the progress made in the past 30 years is that health educators are now engaged, not only by health departments and departments of education, but also by colleges, universities, industrial plants, commercial enterprises, and local health units, as well as by national health groups. These health educators have an opportunity to improve the personal and community living of many millions of people.

Then, too, as science progresses and the whole world draws closer together, our responsibility and opportunity are enlarged. The recent creation of a Health Education Division in the World Health Organization, with the able service of Dr. Clair E. Turner as Consultant and Miss A. Helen Martikainen as Director in the Geneva office, is a magnificent recognition of the growth of this new field of professional service.

Although these are all indications of progress, are we doing all that well trained people can do to influence health

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* Hobbs, Pauline. We Answer the Public. *A.J.P.H.* 40, 9:1135–1138 (Sept.), 1950. This study was not made by the Maryland State Department of Health. It was carried out unofficially by the writer, who was then a part-time graduate student in the Education Department of Johns Hopkins University.

behavior, or have we too often slipped back to the philosophy that knowledge will necessarily result in practice?

Books, articles, speeches, conversations, and observations lead me to believe that our sights and goals can be lifted—we can demand more of health education than has yet been achieved. However, this is only posible if we will face the facts and fully assume the responsibility that is ours. Mortality and morbidity figures show a reduction that is colossal, but rejections in the Armed Services for physical causes are again in 1950 much higher than is warranted by a health education program that has been in operation for three decades!

Where is the fault?

Dr. Herbert T. Wagner, Director of Hospital Services of the National Foundation for Infantile Paralysis, has said, "Educational and health services have been too frequently divorced from the general community, and they cannot be so separated successfully."

School health texts are available containing accurate material written with a view to interesting the child or older student in the subject matter. Probably no one aspect of education has shown so great an advance within this period as have health texts. These are the core of health teaching in schools and colleges, but there is too little consideration given by health educators to the content of these books *in relation to local situations*.

It is well worth while to check the subject matter taught in the schools of an area in which the health authorities are faced with specific problems that call for immediate action on the part of the adult population. During an epidemic of measles, for instance, every child in the school system should be aware of precautionary measures and symptoms. This can be accomplished through the teachers, in relation to the age level of the pupil, without deviating from the goal of a well rounded health education program. Wind, tide and weather may influence the navigator, but his goal is fixed.

Are we selecting vital factors for emphasis? In the Philippine Islands, teachers from the United States were attempting to teach the rudiments of health to a very primitive tribe, but little progress was evident. Consultants reviewing the situation found that the use of knives, forks, and spoons was being insisted upon with children who were accustomed to eating with their fingers, while little attention was given to hand washing before meals. Obviously hand washing was a more important habit to be established than the use of implements, though that might well come later. A running stream nearby, a hollowed log filled twice a day by the children themselves, and they had the equipment for hand washing. A new point of view on the part of the teachers as to the relative importance of health practices made this possible, and the children accepted the procedure with pleasure.

It may be pertinent at this point to remark that so far is the concept of health education from being universal in the public mind that it was only in 1949 that an appropriation for soap and towels was made for the public schools of New York City!

In the Virgin Islands, where water is scarce and precious, ingenuity and the sun long ago enabled school children to wash their hands before lunch. Each child brought with him his own can of water—the can often salvaged from the dump and made practicable for carrying by a plaited straw handle. One child poured half a cup of water, together with a little liquid soap, into a cupped hand, and after a lather had been produced by vigorous rubbing, another half cup for rinsing. The sun of the Virgin Islands made towels unnecessary. This was fun for the children, and who can doubt that they learned the essential lesson—food should be touched only by clean hands.

Kate Douglas Wiggin once said, "To cure is the voice of the past, to prevent the divine whisper of today." This wise saying epitomizes the great change in viewpoint between our present era and that of 1918, when the health education movement first took form.

Health education has blossomed during the period when prevention has been the keynote, for it is admittedly preventive in its nature. We have therefore greater opportunities for education in health than ever before.

One might think that with all the effort expended on this subject, all the books, magazine articles, all the radio health talks, in addition to instruction in the schools, no individual would remain uninstructed or unconvinced. However, anyone connected with any form of social welfare, anyone, indeed, with a large circle of friends, still comes across instances of amazing indifference to the simplest health habits.

For the past seven years it has been my privilege to work in the field of education in connection with one disease —poliomyelitis—my assignment being to educate the people of the United States about the disease and its treatment. My star of great magnitude!

This has involved ascertaining the status of people's knowledge, as well as their attitudes regarding polio. Facts were gathered within a few months through daily inquiries received from the public, an objective study of a large segment of the public—the school population—and discussion. It was soon clear that fear, unreasonable fear without knowledge of the nature of the disease, must be combated with facts.

My second star, backed by the slogan, "Facts Fight Fears," set in motion a way to furnish the facts to those who sought them through inquiry and to leaders in positions to educate. As schools constitute the largest unit of the population, the coöperation of all the national and state educational associations was secured. Their organs of communication—journals and bulletins—readily accepted articles which were prepared for them by authors familiar with the specific needs of the readers as well as with the subject matter.

Inquiries were answered promptly with printed matter, together with a courteous acknowledgement that conveyed interest in their particular problem and a desire to serve them further. It is significant that this procedure increased inquiries 4,000 per cent in the first four months of this service.

A study of school health texts used in high schools and colleges brought to light weaknesses in subject matter, inadequate statements and inaccuracies. These were reported to each of the publishers who had furnished books, with an offer to review manuscripts before the revised editions were published. Many have taken advantage of this service. In this way, up-to-date facts are gradually being introduced into textbooks.

In the interval, a high school unit for instruction about polio was prepared by a competent science teacher, whose material, after a semester of use with students, was edited and published as supplementary material for students and also as a guide for teachers in the use of the student book.

By the use of various media the entire public has been reached to some extent through organized groups, men's and women's clubs, health educators, and other health and welfare workers, but the program has had as its core prompt attention to queries by correspondents, each of whom is skilled and familiar with the field from which the inquiry has come.

The tools used in health education have value only in proportion to the interest and understanding of those who use them. For example, upon checking the wording of a proposed publication with a cross-section of more than 4,000 people in an average community, it was

found that five terms used were not sufficiently familiar to be understood. This was important because it involved a publication which was to be distributed to 30 million homes through school children.

On the other hand, we also err in failing to satisfy the curiosity of the public regarding health promotion and disease because we underestimate the extent of their interest. The National Foundation for Infantile Paralysis has demonstrated to an extent that has not heretofore been proved that the public will read and listen to addresses, view films and exhibits about a disease for which no preventive or cure can be offered. The public will also support with its time and its funds research, as well as care for patients, when the facts are so presented to them that they can identify themselves with the conditions to be overcome. Health education procedures have had only a small part in the accomplishments of this group, but it is notable that the distinguished men constituting the trustees, who decide upon the appropriation of funds, consider health education of sufficient importance to warrant their support.

Take the public into your confidence, give them the facts, assure them that as new truths are unearthed in the laboratories, classrooms and hospitals, they will be told about them.

As one who has been in the field of health for a half century, with 40 of those years in public health, it is still possible to believe that through procedures of an educational nature the gap between knowledge and practice can be lessened. This cannot be accomplished by health educators alone, but rather through the efforts of all engaged in health promotion and welfare.

The swing on the part of the medical profession from the skepticism which was strong in the early days of the movement is evident in the thousands of men and women who are now employed by health departments to serve as health educators.

When the private practitioner becomes equally convinced that there are techniques known to the educator which can be utilized to promote the health of his patients and their families, another ally of great value will have been added.

Then, too, all who are concerned in activities for human welfare are logical teachers of health, yet few there are who are even aware that there is a profession of health education producing workers prepared to lend a skilled hand in their endeavors.

To increase awareness of health education as a tool that can be effectively used by physicians and social workers is thus another star to be added to the galaxy. Whether the program we plan or direct is a local or national one, it is worth while to set our sights toward the ultimate goal, knowing full well that this cannot be attained in its entirety, nor immediately, but being aware that each accomplishment is in the direction of the star of greatest magnitude—maximum health for all the people.

The Industrial Hygiene Program in Industry*

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INDUSTRIAL hygiene programs supported by industry are a relatively recent development and although they may vary slightly in their scope, the general pattern is the same and their purpose is clear. Industries expect their industrial hygiene departments to tell them exactly what new and old processes and operations or proposed changes they need be concerned about, why they need be concerned, and the corrective methods from which to choose. Industries want to know when employee complaints stem from uncomfortable or possibly harmful environmental conditions and when the complaints are unfounded. They want to know that recommendations for environmental improvements are sound and justifiable and how the most can be accomplished for each dollar expended. Industries want to keep conditions in their plants beyond the reproach of official health enforcement agencies. They want occupational disease to be a rare, not a routine, incident.

Business is conducted on a practical, or profit and loss, basis and when losses equal or exceed profits, you do not stay in business long. Industrial hygiene programs that are not basically sound are not likely to survive the test of time. The programs I am going to discuss are current programs conducted in recent years by a number of different industries. These programs vary in scope, mainly in their fringe interests. All of them, however, include the basic industrial hygiene activities of recognizing environmental air contaminants and abnormalities, whether of a nuisance or really harmful nature, measuring their magnitudes in relation to some readily understandable or similar situations or to accepted bench marks, advising as to the possible and the probable effects of these environments upon the health of the employees and what methods of control are necessary or desirable. In response to management's demands for technical data of a factual nature, this basic or minimum scope of industrial hygiene has been supplemented by other activities where the same knowledge and techniques can be applied.

The most generally accepted of these fringe activities pertain to the problems connected with outdoor air pollution. Others, in the approximate order of their prevalence in the industrial hygiene programs in industry are: Fire and explosion prevention (gases, vapors, and dusts), toxicological research investigations, industrial waste disposal, sanitation, and possibly nutrition. These programs do not ordinarily include industrial medicine, safety, nursing, or medical care. Most, if not all, successful programs in industry are more closely associated with the medical than with the safety departments—associated in such a manner as to produce a free exchange of information with both these departments without placing any restrictions on the work or

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-eighth Annual Meeting in St. Louis, Mo., October 31, 1950.

the dissemination of factual data developed by the industrial hygiene staff.

The scope of any particular program may be influenced by the following circumstances:

1. *Type of industry.* Many industries have problems peculiar to the operations in which they are engaged. Some, such as chemical manufacture, may present outstanding environmental control problems, while others, such as machine shops, have relatively minor ones. The chemical plant manufacturing, for instance, sulfuric acid also has problems somewhat different from the one manufacturing toxic chemicals such as TNT or tetraethyl lead.

2. *Size of the industry.* The industry with less than 10,000 employees is likely to be somewhat restricted in the size of its industrial hygiene staff and consequently in the scope of its industrial hygiene program, but no industry should be without some industrial hygiene consultation.

3. *Experience and ability of personnel engaged in industrial hygiene work.* The chemist may be primarily interested in the nature and amount of contamination in the atmosphere, while the man with a toxicological or pharmacological background may be chiefly interested in the effects of these materials on the human system. The mechanical engineer and the chemical engineer lean more to the engineering-control viewpoint. Men with a bacteriological or sanitary engineering background may place waste disposal among their major interests. The physicist may emphasize radiation problems. The physician, whether he is a part of the department or is in the associated medical department, is more interested in the clinical aspects. Industries that have well staffed medical departments working closely with the industrial hygiene departments frequently do not have physicians on the industrial hygiene staff, the medical aspects of the problems being handled in the medical departments.

4. *The attitude of top management.* When management is completely "sold" on health maintenance, everyone is conscious of and interested in health and safety problems. Health education in new or specific circumstances is more easily accomplished.

5. *The community.* The community may be friendly and interested, uninterested, or even hostile. The level of intelligence and the attitude of workmen is important. Both of these affect the employee education program.

6. *Organization policy.* The organization policy has a profound effect upon the results produced by an industrial hygiene department—more so perhaps than any other single factor. First, the industrial hygiene department should have ready access to some policy-forming executive on the managerial staff, as well as to all plant managers, plant engineers, personnel directors, physicians, and safety engineers.

It is of vital importance that the industrial hygienist personally discuss his major recommendations with the persons expected to implement them. There is no equally satisfactory way to get the message across correctly and with mutual understanding and acceptance of details. It is a mistake to establish roundabout channels through which reports and information developed by the industrial hygiene department must be routed. To have someone outside the department edit or reword a report is likely to introduce confusion and lack of understanding. The information is factual and no one should imply that it needs to be censored or modified by a member of another department before reaching its objective. Recommenda-

tions of a strictly engineering nature are sometimes not cordially received by the plant manager or plant engineer when they arrive over the signature of a physician if he has neither engineering education nor experience. Neither does the plant physician welcome strictly medical information that has been "approved" by non-medical personnel.

A question that sometimes arises is how to determine when to expand the industrial hygiene staff. I wish all questions were as easy to answer as that one. The rule in industry is to have a job for a man to do *before* he is hired. The demands for industrial hygiene service increase as the managers and the various other interested persons such as personnel directors, labor relations directors, medical directors, plant and process engineers, and safety engineers learn of the services offered that have a direct bearing in making their own work easier and more effective. The only problem is to maintain an orderly balance between the demands for service and a capable staff to deliver the service before a prolonged period of waiting has caused dissatisfaction. If the occasion has passed for application of the desired data to the problem at hand, an opportunity may have been lost. There may be no restrictions upon expanding the application of industrial hygiene, but there are likely to be restrictions upon expanding the staff in advance of a demand for their services.

The selling of the industrial hygiene program is based on the philosophy that man power represents the most important investment that a company has—more important in dollars and cents than the investment represented by buildings and equipment. The way to sell industrial hygiene to management is to inform each of the persons concerned just what industrial hygiene has to offer that will help him to do his particular job better or more easily. We can make our work more effective by sensing the right time to advance an idea or a project. The right time occurs when statistics or other data are available for compilation into a convincing presentation. The data may be obtained from various sources such as medical and accident records, absentee records, or records of labor turnover. They might even be records before and after industrial hygiene methods were introduced in our own or a similar industry. Statistics, made pointed and concise from accurate data and presented to the right people or in the right publication, may reach important places and persons that are not within the normal or routine reach of the industrial hygienist personally. As the occupational disease rate approaches zero, additional data may be desired to avoid complacency.

What do all these activities cost in dollars and cents? The most modest one man program, consisting essentially of what this one man can advise from what he sees and hears, costs a minimum of $5,000 to $10,000 a year. A unit consisting of three or four persons, with suitable laboratory facilities, costs about $30,000 to $50,000. Where extensive traveling is a necessary part of the program, the cost is a few thousand dollars more. The industry with upward of 50,000 employees may find it advantageous to acquire a somewhat larger staff. As an over-all approximation, I might suggest one industrial hygienist for each 10,000 employees. The number of employees that can be served effectively by one industrial hygienist, however, varies widely with the scope of the program and is subject to other circumstances previously mentioned.

If we accept the above figure for the purpose of a discussion of costs and, for the same purpose, arbitrarily assess a figure of $10,000 as an approximate yearly cost of an industrial hygienist and the facilities necessary to the conduct of his work, we arrive at the figure of one

dollar per year per employee as the approximate cost of the industrial hygiene program. As a matter of fact, the actual cost of the few industrial hygiene programs for which I have been able to obtain estimates ranges from less than 50 cents to $2.50 per employee per year. One company is considering a program estimated to cost $5.71 per employee the first year.

These figures do not include the cost of engineering control installations such as hoods, ducts, and air cleaners. The expense of such items may logically be considered a part of the health and safety program as a whole, but not of industrial hygiene specifically, since they are a necessary expense regardless of an industrial hygiene program and their cost is usually reduced by the engineering know-how offered by industrial hygiene personnel.

These figures represent a very modest sum when compared to medical costs of $6 to $30 and safety costs of $4.50 to $66 per employee per year in the same group of industries. This gives us some orientation regarding the *expenditures* necessary to provide industrial hygiene service in industry.

Placing a tangible or monetary *value* on the fruits of this service would be a more difficult problem. I shall mention some of the more obvious benefits to be expected from an industrial hygiene program in industry:

1. It provides facts regarding the environment and recommendations which, if followed, will prevent occupational disease or at least reduce its incidence to a minimum.

2. It saves a substantial amount of money that otherwise would be spent as compensation for occupational diseases.

3. It builds good will among the employees and throughout the community by making the working environment safe and attractive, and by preventing excessive atmospheric pollution arising from the plant.

4. It demonstrates the company's personal interest in the health and welfare of the employees and improves personnel relations when employees find that management is willing to investigate and study complaints in order to allay fears and provide necessary controls.

5. It provides factual information for key personnel as a basis for educating employees in safe work methods and procedures on both routine and infrequent production processes.

6. It offers opportunities in process development for studying initial or pilot plant operations and for developing control measures and safe working procedures that can be introduced with the new processes when they go into production. Likewise, through the industrial hygiene department, the environmental control information developed by any one production group becomes available to other units of the corporation.

7. An industry that provides its own industrial hygiene service is in an advantageous position because it does not have to depend upon outside sources such as consultants and official agencies, sometimes understaffed and overworked. Having its own industrial hygiene service enables an industry to plan and coordinate its production and hygiene programs in an orderly manner without unexpected production interruptions or delays that could stem from action based upon the results of an isolated visit. For instance, an inopportune survey conducted during the introduction of a new process may yield unfavorable results that, though harmless in their temporary nature, may be misinterpreted as representative of routine or prolonged conditions. An outside survey during a critical stage of a labor relations problem might prolong or aggravate the problem.

8. The results of environmental studies as well as the analyses of biological specimens can serve as a valued clinical diagnostic aid for the plant physician.

9. A function within the scope of all industrial hygiene departments is a comprehensive literature search to determine the experience recorded by others pertaining to the use, analysis, toxicological effects of, and control methods applied to, any material in which management becomes interested. A literature search is much more than a search through a single source, such as *Index Medicus* or *Chemical Abstracts*. It is more than a matter of accepting whatever a friend, a competent secretary, or a librarian may produce upon request. It is a search of many sources and is designed to bring to light any published material of significance.

What general yardstick can we apply to determine whether we are reaching our objectives?

The outstanding yardstick for the industrial hygiene department is the

Golden Rule. It applies equally well to our dealings with other departments, with management, and with the employees. If we can answer the following questions in the affirmative we have done a pretty good job:

1. Are we coöperating fully with the medical, safety, and personnel departments and keeping them completely informed of our work?
2. Are we guided solely by facts in the investigation of employee complaints regarding working conditions?
3. Would we be willing to work or have the members of our immediate family work in any occupation in our company's plants and not fear that they would risk contracting an occupational illness?

If we want to know what kind of progress we are making, we can get out one of our old reports of a plant, an operation, or a process that we were considerably concerned about at the time, investigate and appraise the plant again, and see just how well our advice was followed and whether operations have been satisfactorily controlled. The success of our program is pretty accurately reflected in the amount of improvements that have been made in the process and in the attitude of the management.

Another good test of the success of our program is the welcome we receive when we return to a plant one, two or three years after we have made some rather sweeping recommendations for improvement. If we proposed and "sold" a sound program, the manager is likely to have seen the benefits he has derived from following our recommendations, and our reception will be favorable.

In summary, may I say that the industrial hygiene program in industry exists for the primary purpose of preserving health through the recognition, evaluation and control of environmental causes and sources of illness among employees. Many factors may influence the emphasis of the program, or they may expand its scope. The cost to industry for its own industrial hygiene service is nominal and fractional compared to the values received. The most satisfactory yardstick with which to measure the results is the Golden Rule.

October 15 is the Fulbright Deadline

Approximately 230 Fulbright Awards are available for university lecturing and advanced research in Europe and the Near East for the academic year beginning in the fall of 1952. The countries in which arrangements for study have been made are: The United Kingdom and Colonial Dependencies; Norway; Netherlands, Belgium and Luxembourg; France; Austria; Italy; Greece; Egypt; Turkey; and Iran.

Further information and application blanks should be secured from: Executive Secretary, Committee on International Exchange of Persons, Conference Board of Associated Research Councils, 2101 Constitution Avenue, Washington, D. C. For predoctoral study, application should be made to local Fulbright Committees or to the Institute of International Education, New York City.

Applications must be mailed not later than October 15, 1951. For participating countries in which the academic year begins in spring or early summer, applications closed on April 15. These are Australia, New Zealand, India, Pakistan, the Philippines, Burma, and Thailand. These dates should be borne in mind for future years.

Epidemiologic Studies in Dental Caries, III: The Interpretation of Clinical Data Relating to Caries Advance*†

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TWENTY-FIVE years ago we first observed that children with diabetes mellitus tended to have less advance of tooth decay than does the usual child.[1] Further observations indicated that such freedom from advancing decay was conditioned by the degree in which the child's food intake approached accepted nutritional standards, and in which his diabetic anomaly was controlled through the use of insulin.[2] Within two months after the routine of diet and insulin management had been established, open cavities would become stony hard at their base, and no new cavities would develop. Among diabetic children who failed to observe the prescribed regimen, caries tended to appear and to advance as rapidly or more rapidly than in the average child. The serial dental data for a group of diabetic girls are summarized in the first chart (Figure 1). Each horizontal bar represents the dental course of one child for successive years; the zones shaded black represent periods when no new caries could be detected. It will be noted that most of the periods of observation were characterized by non-advance of caries, and that the total increment of new caries was very low.[3]

To serve as an index of the commonness of such findings among non-diabetic children, we reviewed the dental records of 100 school children who had been cared for at the university dental infirmary for not less than three consecutive years. The graphic record of the 40 girls from this series is shown in the next chart (Figure 2). It will be noted that most subjects had some periods of non-advance of caries, but that caries progression was the rule and that for most of them the caries increment was notable from one year to the next.[4]

Influenced by the published work of Beust[5] and of Bodecker,[6] we had interpreted the hardening at the bases of the open cavities as evidence of deposition of sclerotic dentin. Occasional histologic studies of teeth which clinically had developed arrest of caries showed that the dentin lying between the enamel defect and the pulp had become dense and stain-resistant. Naturally shed, deciduous teeth of children who had been under diabetic management for long periods before exfoliation showed dentin more completely sclerosed than is customary in children's teeth: more nearly analogous to the sclerosed dentin of the permanent teeth of adults. We believed that caries had become arrested in the diabetic patient's teeth through the effect of homeostatic mechanisms working from within the tooth. This belief has led to the premise that the body

* Presented at a Joint Session of the Dental Health and Food and Nutrition Sections of the American Public Health Association at the Seventy-eighth Annual Meeting in St. Louis, Mo., November 2, 1950.

† This study was made possible through a grant from the Sugar Research Foundation.

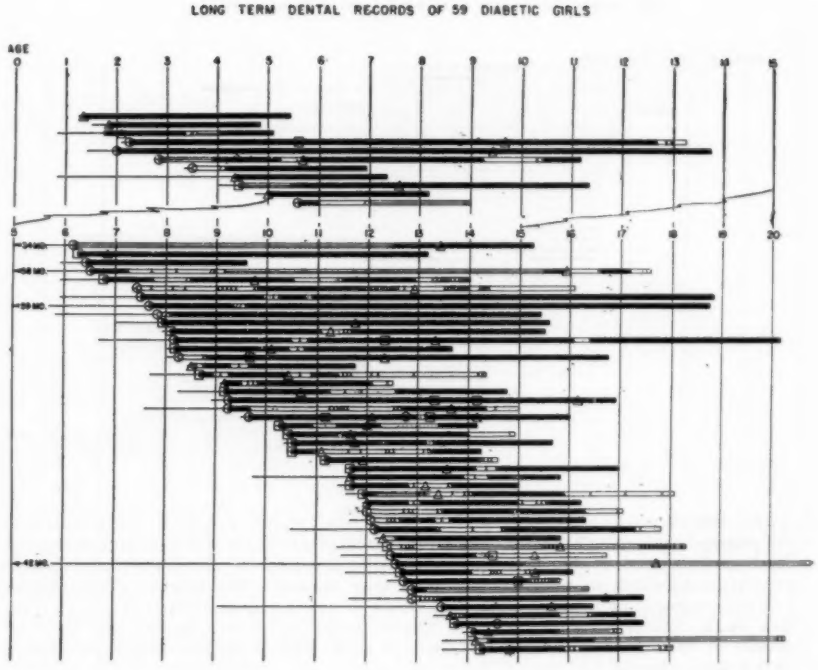

FIGURE 1—Individual records of progressive dental status of 59 girls with diabetes mellitus. Length of each bar indicates duration of intermittent dental observation; solid black areas represent periods of freedom from new dental lesions; unshaded areas contain symbols to indicate number of tooth surfaces with new lesions which appeared during the corresponding period. Symbols have meanings as follows: diagonal line, one dmf (deciduous) tooth surface; crossed diagonal lines, one DMF (permanent) surface; dot, one surface with a precarious lesion apparently limited to the enamel (preponderantly pits and fissures, developmental in origin, present when tooth first erupted). Intervals of prolonged non-observation are indicated by a horizontal line through the bar. The duration of diabetes mellitus prior to the initial dental examination is indicated by the length of the single horizontal line to the left of each bar graph. (DMF signifies decayed, missing or filled). (Taken from reference 3.)

possesses natural defense mechanisms which can prevent the development or the advance of tooth decay if proper metabolic conditions can be maintained.

This concept of natural defense mechanisms for the tooth has been difficult to reconcile with the classic expression of the chemico-parasitic theory of caries causation. Most individuals holding to the regional concept of caries causation have assumed that the erupted tooth is an inert structure, incapable of change of composition through interchange with the internal fluids of the body. Proponents of the chemico-parasitic theory explained our findings in diabetic children's teeth as dependent on the prohibition of sugar from diabetic diets. We had observed numerous instances where dental caries came to arrest among children who were not diabetic and who had continued to ingest sugar, but our data were not sufficient in numbers nor were the variable factors controlled sufficiently to give statistical significance to these findings.

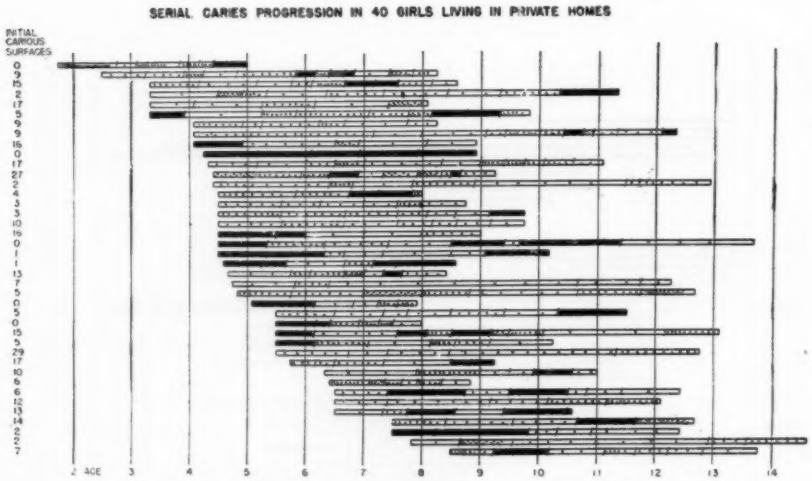

FIGURE 2—Diagrammatic representation of the serial dental status of 40 girls. Each horizontal bar portrays one subject's record. The position and length of the bar indicate age and the duration of observation; oblique lines indicate interim dental examinations; black areas indicate periods during which no newly carious areas were detected. The number of dots within unshaded segments of a bar indicate the number of newly carious surfaces detected at the close of the corresponding interval. The number at the left of each bar indicates the total number of DMF surfaces in the mixed dentition at the time of the first dental examination. (Taken from reference 4.)

There was need for controlled observations to establish the spontaneous variability of caries progression that one might expect to encounter in the general child population.

Clinical studies of dental caries progression seldom have followed the serial course of tooth decay for the individual child for long periods of time, as we had done with the diabetic children and with those drawn from the dental clinic which I have cited. Most published estimates as to the rates of advance of caries have been based instead on cross-sectional observations for a given child population, with estimation of caries advance rates for the group as a whole through differences of values for respective age levels. Such studies serve a valuable purpose as they relate to the general population, but are of little assistance in indicating what one may expect to observe in the individual child, either as to the likelihood of variability from the estimated value or as to the regularity of progression of caries. For that reason they are of no particular value as bases for comparison with studies similar to the ones we have performed. Moreover, most reported studies have dealt with unregimented or poorly regimented populations, without attempt to appraise or to control the many agents which may affect the individual rates of caries advance.

We have recognized the need for a well controlled, long-term, individualized study of caries progression in children's teeth under conditions which would permit control of as many variables as possible. We had two objectives in mind for such a study: One was to learn more about the constancy of the long-term pattern of caries advance in the mouth of the individual child under standard conditions. The other was to compare

the rate and pattern of caries advance among children whose sugar intake was manipulated widely, with the corresponding pattern before and after the diet regimentation had been in effect, as well as with the rate and pattern observed concurrently in a group of control subjects.

When opportunity permitted, we undertook such a study. To meet the exacting requirements as fully as possible, it was necessary to use subjects already living under conditions of limited regimentation. The most appropriate group for our purpose was that to be found in one of our state schools for the mentally retarded. Out of a population of about 2,000 persons of all ages, we found 250 boys and girls between the ages of 13 and 20 years. This age group seemed best for study because it avoided the consideration of deciduous teeth. We would have preferred greater uniformity of age, but we needed more subjects than could be provided with a narrower age range. Not many more than 200 proved to have capacities for adequate coöperation in our study. The experimental subjects were chosen from the girls; the remaining girls and the boys served as separate control groups. This report will be limited primarily to consideration of the experimental and control groups of girl subjects (Table 1).

During midsummer of 1946 the initial dental examinations were made. Similar examinations have been made several times each year since then, and they still are in progress. As a corollary of the dental examinations, estimations of Lactobacillus frequency in saliva have been made recurrently for most of the subjects. During the first two years of the study we were able to establish rates for the spontaneous advance of caries for each subject while all phases of institutional life still remained unmodified.

During the second year, about 70 of the girls were chosen from the group as a whole to serve as a pool from which the experimental personnel would be drawn. Graduate dietitians appraised the diet practices at the institution and studied means for bringing the quality of food intake for the experimental group up to the National Research Council's recommendations. Two sets of menus were prepared, relatively constant as to content of protein, minerals, vitamins, and caloric equivalence, but so designed that one set avoided the use of any refined sugar or its products, while the other provided not less than three ounces of sucrose daily, usually as a constituent of foods, sometimes as candy which would be eaten at the table with the meal. Foods not available through the institution were purchased or else were furnished through the courtesy of various agencies.* Further details relating to the routine of management have been published.[7]

The diets devoid of refined sugar were

TABLE 1

Initial Status of Girls Who Comprised the Experimental and Control Groups, and Number of Dental Examinations Each Year of Study

	Experimental Group	*Control Group*
Number of subjects	64	52
Age when first examined (months): 1st quartile	153	148
Median	178	190
3rd quartile	193	208
Initial number of DMF tooth surfaces: Mean	7.6	8.3
S.D.	4.3	6.1
Filled tooth surfaces: % of total number of carious surfaces	22%	19%
Incidence of poor dental hygiene	25%	40%
Number of dental examinations made during each of the four years of the study: 1946–1947	129	197
1947–1948	173	176
1948–1949	254	131
1949–1950	118	60

* We are indebted to the Pineapple Research Institution of Hawaii, to the Iowa Dairy Industry Commission, and to the Vitex Corporation for the provision of pineapple juice, dried skim milk, and Vitamin D concentrate, respectively.

TABLE 2

A—The Pattern of Caries Increment among Both Male and Female Subjects during the First Two Years of the Study, When None of the Subjects Were under Diet Regimentation

	Mean	Quartile Distribution 1st	Median	3rd	S.D.	S.E. Mean
Number of DMF surfaces when first examined	8.4	4	7	11		
New DMF surfaces noted during 2-year period	5.13	3	5	7	3.74	.275
Duration of freedom from newly carious surfaces (months): longest consecutive period	9.7	6	7	15		
Aggregate duration	11.3	6	11	17		

B—Contrast of the Duration of Freedom from New Caries among the One-fourth of the Whole Group Who Had the Lowest Net Rates of Caries Advance during the Two-year Period with the One-fourth Whose Net Rates Were the Highest

	Consecutive Duration of Freedom from Newly Carious Tooth Surfaces (months)				
	Mean	1st Quartile	Median	3rd Quartile	Maximum Value
Range of values for net caries progression rates:					
lowest one-fourth	13.4	6	12	18	24
highest one-fourth	6.8	5	6	7	18

inaugurated in May of 1948 and remained in effect until December. Because of the holiday season, diet regimentation was relaxed during December. On January 1, 1949, the high sugar regimen went into effect and was maintained for the succeeding six months. Sixty-four of the girls from the experimental group served as subjects for diet regimentation for the 12 month period. During that time the remainder of the girls and all the boys continued to follow the usual institutional diet regimen, with no special emphasis on the amount of sugar consumed. Since July of 1949, all subjects have been merged again into the usual pattern of institutional life and routine.

RESULTS

This report is based on the data collected during the first four years of study of this institutionalized population. It deals with the variability of rates of caries progression under spontaneous conditions of life and of oral environment, and with the observed effect of widely different levels of intake of refined sugar on rates of caries progression. It does not take into account any possible role which native sugars from vegetables or fruits might have on the teeth. Five observations from our study will be considered, as follows:

1. Almost without exception, new cavities tended to appear in an intermittent manner in the mouth of the individual child, even though the conditions of life and of diet remained similar. Long periods of freedom from new cavities were the rule rather than the exception. Basing our observations on the dental course of 212 boys and girls throughout the two first years of the study, when no regimentation was in force, 90 per cent of the subjects had at least 3 consecutive months of freedom from new cavities; 40 per cent had at least 10 consecutive months of such freedom. Even among the 25 per cent of the subjects whose scores for new caries lesions were highest, 11 months or longer of freedom from new lesions was not infrequent (Table 2). From this observation, as well as from earlier studies, we believe that the clinical progression of tooth decay usually is an inconstant process and that the isolated observation of non-progression of caries cannot be accepted as evidence of increased caries resistance.[8]
2. During each of the four years of observation, there was little constancy from one subject to another as to the number of new carious lesions. The scatter of values was notable both among the experimental and the control members. The coefficient of variability seldom was less than 60 per cent for any set of values. The average value, when con-

TABLE 3

Average Number of Newly Affected Tooth Surfaces During Each of Four Successive Years of Observation of the Girls from the Experimental and the Control Groups

Year of Study	Nature of Diet: Experimental Group	Nature of Diet: Control Group	Number of New DMF Tooth Surfaces Per Annum: Experimental Group: Mean	S.D.	S.E. Mean	Control Group: Mean	S.D.	S.E. Mean
A—Beginning with Midsummer, 1946:								
First	Unmodified	Unmodified	2.82	2.46	0.43	3.0	1.8	0.39
Second	Unmodified	Unmodified	3.02	2.30	0.346	3.12	2.1	0.446
Third	No refined sugar for 6 months; then 3 oz. sucrose daily for the next 6 months	Unmodified	4.9	1.03	0.134	5.62	4.90	0.83
Fourth	Unmodified	Unmodified	3.56	2.54	0.352	2.39	2.44	0.508
B—Beginning with Midwinter, 1946:								
First	Unmodified	Unmodified	2.6	2.32	0.34	3.5	1.6	0.34
Second	First 6 months unmodified; then no refined sugar for the next 6 months	Unmodified	5.2	4.1	0.55	5.6	3.2	0.70
Third	3 ounces sucrose daily for 6 months; unmodified diet for the next 6 months	Unmodified	3.2	2.26	0 31	4.0	4.35	1.06

TABLE 4

Analysis of Variability of Rates of Caries Progression for Experimental and for Control Groups for the Same Year *

A—For the Four Successive Years Beginning With Midsummer of 1946:

	Mean Value, New DMF TS	Difference of Means	S.E., Dif. of Means	Critical Ratio
First year				
Experimental group	2.82			
Control group	3.0	— 0.18	0.58	0.31
Second year				
Experimental group	3.02			
Control group	3.12	— 0.10	0.565	0.178
Third year				
Experimental group	4.9			
Control group	5.62	— 0.72	0.93	0.775
Fourth year				
Experimental group	3.56			
Control group	2.39	+ 1.17	0.62	1.88

B—For the Three Successive Years Beginning With Midwinter, 1946

First year				
Experimental group	2.6			
Control group	3.5	— 0 9	0.48	1.87
Second year				
Experimental group	5.2			
Control group	5.6	— 0.4	0 89	0.45
Third year				
Experimental group	3.2			
Control group	4.0	— 0 8	1.43	0.56

* Based on data from Table 3.

TABLE 5

Analysis of Variability of Rates of Caries Progression for the Same Group of Subjects During Successive Years *

A—For the Four Successive Years Beginning With Midsummer, 1946:

	Contrasted Years:				
	1:2	1:3	1:4	2:3	2:4
Experimental group:					
Difference of means	0.20	2.08	0.74	1.88	0.54
Standard error, difference of means	0.55	0.605	0.555	0.548	0.494
Critical ratio	0.364	3.44	1.33	3.43	1.09
Control group:					
Difference of means	0.12	2.62	0.61	2.50	0.73
Standard error, difference of means	0.91	1.1	0.95	1.17	0.98
Critical ratio	0.12	2.38	0.64	2.14	0.745

B—For the Three Successive Years Beginning With Midwinter, 1946:

	Contrasted Years		
	1:2	1:3	2:3
Experimental group:			
Difference of means	2.6	0.6	2.0
Standard error, difference of means	0.65	1.04	0.633
Critical ratio	4.0	0.58	3.15
Control group:			
Difference of means	2.1	0.5	1.6
Standard error, difference of means	0.79	1.236	1.27
Critical ratio	2.66	0.49	1.26

* Based on data from Table 3.

sidered together with the standard deviation, served to indicate the course of the entire group but was of little value for predicting the course of any individual subject (Table 3).

3. Using the average number of newly carious surfaces within each group for each year as a criterion, there was great variability from one year to another, both for the experimental and for the control groups. For a given year, the type and degree of oscillation of the average value tended to be parallel for the experimental and the control groups. Even among the subjects who were under no manner of imposed regimentation, and who seemed to be living under comparable conditions throughout the four years of the study, the differences of the means from one year to another presented significant differences (Table 4).
4. The differences between the experimental subjects and the control group during the periods of contrasted diet tended to be smaller than those between either of the groups' values for successive years of the study. There was no significant difference as to the average rate of caries advance between the experimental and the control group, either for the year of sugar manipulation or for the next year. Moreover, when the 12 month period of sugar manipulation was redivided so that the 6 months of sugar abstention were included with the 6 months of unmodified diet which preceded them, and similarly the 6 months of high sugar ingestion were included with the next 6 months of unmodified diet, still there was no significant difference between the mean values. The pattern of frequency distribution of individual values within the two groups also was similar (Table 5).
5. We have not been able to demonstrate any significant relationship between the number of Lactobacilli in the saliva of our subjects and the respective rate of caries advance during the year which preceded, coincided with, or followed the collection of the saliva samples. No significant difference was evident when the average values for new caries among those with zero counts were compared with those with counts exceeding 30,000 Lactobacilli per ml. of saliva.[9]

DISCUSSION

Many fundamental questions relating to dental caries as a human disease remain unanswered. Answers often have been taken for granted, even among students of dental caries, and the errors of interpretation which have resulted

have deprived various critical studies on caries progression of the meaning which they might otherwise have afforded. Further carefully controlled studies will be needed to establish answers to these basic questions, and it is important that such studies be so designed that as many variables as possible be avoided, or their potential effect on the outcome properly weighted. If not, the summated effect of the uncontrolled variables may well outweigh the differences ascribed to the agent being investigated.

One important question calling for answer is the length of time which must elapse before an agent being investigated can lead to clinically recognizable caries. Another equally important question deals with the course of the carious lesion once initiated: Is its progress inexorable? Is it steady? Under what circumstances can it be brought to arrest, and how can the observer recognize such arrest?

These recent studies of ours illustrate the variability of caries progression from individual to individual and the variability in the mouth of a given subject from month to month under supposedly standard conditions. Many studies previously reported have ignored the likelihood of latency of response of teeth to change; have assumed constancy of caries progression; have failed to establish patterns of caries advance for members of their study groups prior to the regimentation of their experimental subjects; and have depended on previously determined rates of caries advance as control values for the current studies. Our observations indicate that such techniques can lead to false interpretations of the efficacy of any regimen being studied.

Consideration also should be given to the initial state of the teeth before experimental conditions have been imposed. If one is measuring caries advance in terms of the rate of appearance of newly carious areas, then opportunities for advance are limited by the number of teeth or tooth surfaces which initially are free from caries attack at the outset of the study. Likewise one may expect a difference in results on the basis of the number of susceptible tooth surfaces which have been filled prior to the start of the study.

Even more important as potential sources of experimental error are the nature and amount of reparative dental services which the patient receives while the study is in progress. The placement of fillings is itself a technique employed to lessen caries progression. Consequently we should not compare caries progression rates among children whose patterns of initial or concurrent dental repair differed significantly. The authors have been impressed by the general lack of consideration of these important factors by experimenters in their choice of samples for the study of caries advance. Our own subjects had received only minimal amounts of dental repair prior to the beginning of our study, and during its course only emergency reparative services were given. Cavities initially present remained untreated and unfilled throughout the course of the study unless they caused the child manifest discomfort.

Even criteria for the diagnosis of dental caries are inconstant. There may be widespread disagreement among examining dentists as to whether or not a specific dental lesion is carious. Serial examinations of the same tooth, even though made by the same examiner at different times, may result in different interpretations from one examination to another as to whether a break in the continuity of the enamel represents the early stage of a cavity or whether it is a developmental defect. When a series of examiners is used and each employs his own criterion of judgment and technique of examination, the results for the total caries score for a given mouth may

differ by as much as 100 per cent.[10] In serial examinations, cavities once described may disappear from the record, due to a change in interpretation.

Such statistical dilemmas have led us to adopt the serial consideration of each tooth surface as a measure of caries advance, rather than to place dependence on the serial total values for affected tooth surfaces for a given mouth. We take into consideration also the extent of the described dental lesion. Most examiners make no distinction in their reports between an incipient cavity and one which has become unmistakable. As a consequence, the total caries score may vary widely through errors of judgment possibly greater in degree than the difference which the examiner ascribes to some agent he has been testing for its power to affect caries progression.

Thus there are many potential sources of error in clinical studies relating to rates of caries advance. The summation of such errors can lead to manifest mistakes of interpretation. It becomes necessary to choose techniques of sampling and of control, of examination and of record, which are as stringent as the objective of the study requires if data of value are to be obtained. Consideration of affected tooth surfaces or of individual caries lesions is more reliable as an estimate of caries progression than is the limitation of attention to the number of affected teeth.

Our own data permit us to distinguish caries progression on the basis of the size, depth, location, and consistency of each carious area listed in our records. The serial study of specific teeth will eliminate many errors which otherwise might arise from the faulty interpretation of individual caries lesions. When it is possible to express results clearly and individually for respective teeth, this seems a better statistical approach than to lose identity of teeth or even of subjects through the merging of data in terms of group averages.

SUMMARY AND CONCLUSIONS

Time does not permit any further exploration of sources of potential errors which are inherent in dental data. We have tried to illustrate the errors which may be concealed in dental statistics and to lead the reader to question the results of reported dental studies until the validity of the experimental conditions, as well as of the conclusions, has been established. In view of the fact that spontaneous variability from one child to another is great, and that such variability seldom is given consideration in clinical studies of caries progression, there is reason to question those reports which have attributed beneficial or harmful effects on the teeth to the use of any specific agency.

Within specific limitations of investigation, we have been unable to demonstrate differences in the caries advance rates among adolescent children when the ingestion of refined sugar was arbitrarily prohibited or was given daily in large amounts. However we wish to draw attention to these limits of our observations, and request that no inferences be drawn which lie beyond the conditions of our study. These conditions are as follows:

a. The study dealt with altered intake of refined sugar and its products only; during both periods of diet control our subjects received liberal amounts of the sugars which are native constituents of vegetables and fruits.
b. During the period of high sugar ingestion, the sugar was given only with meals, and usually as a constituent of prepared foods.
c. The girls receiving the diets of altered sugar content were under a regimen which was designed to provide a complete diet, both quantitatively and qualitatively. The caloric allowance was constant during the periods of contrasted sucrose intake.
d. Lactobacillus counts proved to offer no reliable index of the likelihood or the rates of caries progression among our subjects, either among those under diet regimentation or among the members of the control groups.

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White House Conference Continues

A committee to carry out the objectives of the Mid-Century White House Conference on Children and Youth has been formed. Called the National Mid-Century Committee for Children and Youth, its chairman is Leonard W. Mayo, director of the Society for the Aid of Crippled Children, who was also chairman of the executive committee of the recent White House Conference.

The committee will base its program on the purpose of the White House Conference: ". . . to consider how we can develop in children the mental, emotional, and spiritual qualities essential to individual happiness and to responsible citizenship." It believes a top priority to be the conservation and strengthening of family life amid the stresses of a defense economy.

The National Committee will offer field service to state committees and national organizations with a continuing program, to achieve Conference objectives. It will maintain an information service, and will shortly consider what its research program should be in relation to the many gaps in knowledge about how children develop healthy personalities. Beginning in September, it will publish a bulletin regularly.

Elma Phillipson, who was the White House Conference consultant on national organizations, is executive secretary of the new committee, Lois Gratz is its staff field consultant, and Benjamin Goldenberg the information consultant. Offices are at 4th and Independence Ave., S.W., Washington 25, D. C.

Survey of Literature Relating to Infant Methemoglobinemia Due to Nitrate-Contaminated Water

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METHEMOGLOBINEMIA is due to the presence of methemoglobin in the blood. It may result from the reaction of any one of several oxidizing agents with the hemoglobin normally present in the blood. Unlike the oxygen in hemoglobin, that in methemoglobin is so firmly bound that the methemoglobin cannot function as an oxygen carrier by alternate oxygenation and deoxygenation. Thus, the result may be anoxemia with serious consequences or even death.

Although methemoglobinemia may result from congenital heart diseases, or from the ingestion, inhalation, or absorption, or the medicinal administration, of any one of several drugs or chemicals, an important cause of cases in infants is the ingestion of water high in nitrate. This review of the literature is concerned with the latter cause.

HISTORICAL

According to Eusterman and Keith,[21] Gamgee [28] demonstrated as early as 1868 that the addition of amyl nitrate to blood could result in the formation of methemoglobin. These same authors noted that Binz and Geringer [4] reported in 1901 that the administration of large doses of nitrates to animals may cause the formation of methemoglobin. Medovy, Guest, and Victor [51] credit Stokvis [68] and Talma [69] with describing cases of methemoglobinemia in 1902.

In reviewing the literature, Comly [13] mentioned that van den Bergh and Gutterink [71] reported in 1906 that nitrites could be formed in the bowels from nitrates, and that the nitrite was more likely to be absorbed if the intestine was damaged. These authors noted a few instances in which a nitrite-producing bacillus was recovered from a stool or sputum of individuals having sulfhemoglobinemia. However, it remained for [illegible] [51] to demonstrate *in vitro* that many organisms commonly found in the gastrointestinal tract of man are capable of reducing nitrates to nitrites.

In 1928 Barker and O'Hare [3] described a case of cyanosis in a patient who had been treated with ammonium nitrate. The following year, Eusterman and Keith [21] reported two cases of methemoglobinemia which occurred among a large number of adults administered ammonium nitrate for diuretic purposes. However, after two dogs, to which they administered intravenous injections of the drug, failed to show symptoms of methemoglobinemia, they concluded these cases were due to abnormal metabolic processes in the two patients. In 1933, Roe [60] reported the death of a month-old infant who had been treated with bismuth subnitrate. He was the first to associate nitrates with serious or even fatal cases of infant methemoglobinemia. One year later

Chen, Rose, and Clowes [12] demonstrated that methemoglobinemia could be produced by intravenous injections of sodium nitrate.

Thus, the way was paved for Comly,[13] who in reporting on two cases of infant methemoglobinemia in 1945 concluded that methemoglobinemia may occur in an infant following ingestion of water high in nitrates, especially if the infant is suffering from gastrointestinal disturbances. Maxcy,[47] writing in 1950, noted that subsequent observations have established the validity of Comly's hypothesis.

MEDICAL ASPECTS

Cause—Although methemoglobinemia in infants may be caused by congenital heart diseases,[13, 20, 21] by absorption of dyes used for laundry marking,[31, 61, 78] and by drugs administered in medical treatment,[60, 76] many of the cases reported since 1945, when Comly [13] published his conclusions that infant methemoglobinemia may be due to ingestion of high nitrate water, have been diagnosed as having been due to nitrates in the water used in the feeding formula.[8, 11, 23, 24, 48, 50, 59, 66, 84, 85] Donahue [18] alone has expressed the belief that infant methemoglobinemia may result from nitrates ingested in the mother's or cow's milk. However, no positive test for nitrates could be demonstrated in the milk from two cows fed for a period of 10 days on water containing 114 p.p.m. nitrate nitrogen.[83]

Susceptibility—Comly's hypothesis on infant methemoglobinemia induced by ingestion of high nitrate water caused considerable speculation concerning the effect of age and other factors on susceptibility. This led to a series of experiments conducted by Cornblath and Hartmann.[15] They fed several infants on a formula containing an artificial well water of high nitrate-nitrogen concentration, but failed to produce apparent methemoglobinemia. Further investigation revealed that nitrate-reducing organisms, which they cultured from saliva and gastric juices of infant cases, were active only at a pH level above 4.9. On checking the gastric juices of infants, who previously had developed appreciable levels of methemoglobin, they found no free acid and pH values above 4. Based on this evidence Cornblath and Hartmann concluded that the lack of acidity of the gastric juices of a newly born infant may permit nitrate-reducing organisms to grow in the upper gastrointestinal tract and, thus, to reduce nitrates to nitrites before the former can be completely absorbed. In an older infant the acidity of the gastric juices inhibits the growth of the nitrate-reducing bacteria.

The work of Marriott, Hartmann, and Senn,[45] who investigated the acidity and bacterial flora of 200 infants suffering from diarrhea, supports this hypothesis. The pH of the stomach contents of well infants varied from 2.0 to 5.0, and averaged 3.7; that for infants suffering from bacillary dysentery ranged from 2.0 to 5.0, and averaged 3.0; but that for infants with nonspecified diarrhea averaged 5.6, and varied from 4.6 to 6.5.

Robertson and Riddell [59] considered the total amount of hemoglobin present in the blood and the energy of the enzyme system which operates to reduce methemoglobin to hemoglobin as important. Several observers [13, 61, 71] have suggested that the nitrite formed in the upper gastrointestinal tract is more readily absorbed into the blood system when the mucosa is damaged.

In an analysis of 94 cases, Bosch, *et al.*,[8] noted that the period of exposure to a feeding formula containing high nitrate water varied from 1 to 30 or more days.

Apparently, some of the factors which determine whether or not an infant may have nitrate-induced methemoglobinemia are: (a) nitrate-nitrogen content and

amount of water ingested daily; (b) duration of exposure to a feeding formula containing high nitrate water; (c) presence and activity of nitrate-reducing bacteria in the upper gastrointestinal tract—which is affected by the pH of the gastric juices; and (d) the condition of the mucosa.

Physiological Effects—The characteristic symptoms ordinarily associated with infant methemoglobinemia are the greyish- or brownish-blue coloration, which usually is first noticeable around the lips, spreads to the fingers and toes and over the face, and may eventually cover the entire body.[8] Other symptoms which may be noticed are drowsiness and an increased rate of respiration.[48] Although not always present, methemoglobinemia is commonly accompanied by diarrhea or other gastrointestinal disturbances.[10]

The cyanosis—the greyish- or brownish-blue coloration—is attributed to the anoxemia resulting from the decrease in the oxygen-transporting capacity of the blood.[26] The nitrites, absorbed by the blood, react with the hemoglobin to form methemoglobin. Conant[14] notes that this is an oxidation reaction in which the ferrous iron in hemoglobin is oxidized to ferric iron in methemoglobin. In the latter state the oxygen is so firmly bound that methemoglobin cannot function in the manner of hemoglobin in the transfer of oxygen. Ordinarily this reaction is reversible and occurs without permanent injury to the red blood cells.

According to Robertson and Riddell,[59] methemoglobinemia is usually first noticeable in infants when 10 per cent of the hemoglobin has been transformed to methemoglobin, and severe cases may result when it increases to 20 per cent. However, recovery has occurred in cases where the methemoglobin level has been observed to be as high as 57 per cent.[64]

Diagnosis—Diagnosis of cases of infant methemoglobinemia as being due to the ingestion of nitrate-contaminated water may be either presumptive or absolute. According to Bosch, *et al.*,[8] a presumptive diagnosis is justified when the physical findings are typical and either the freshly removed blood has the chocolate brown color associated with methemoglobin, or spontaneous disappearance of the cyanotic condition occurs within 48 hours after changing the water used in the feeding formula, provided an analysis of the water originally used in the feeding formula shows it to have a nitrate-nitrogen content in excess of 10 or 20 p.p.m.

An absolute diagnosis requires the demonstration of appreciable amounts of methemoglobin in the blood by either a spectroscopic examination or the photoelectric colorimetric method of Evelyn and Malloy,[22] together with analytical results showing at least 10 or 20 p.p.m. of nitrate nitrogen in the water used in the feeding formula. Finch[20] cautions that the blood should be examined within 1 or 2 hours after withdrawal since on standing methemoglobin may be spontaneously reduced to hemoglobin.

Treatment—In general, treatment of infants having nitrate water-induced methemoglobin has consisted of the discontinuance of the use of nitrate-contaminated water and, in the more severe cases, the intravenous injection or oral administration of methylene blue. Oxygen therapy, also the administration of such drugs as ascorbic acid, thiamine, and niacin, has been suggested, but for one reason or another none of these treatments has found general use.

In cases where a water of permissible nitrate content could not be obtained, Comly[13] recommended feeding whole milk, preferably acidified and boiled. Stafford[66] suggested that the new-born infant be retained in a hospital until the safety of the water to be used in the feeding formula has been determined.

Various observers[29, 51, 66] have reported the recovery of infant methemo-

globinemia cases following the change from use of nitrate-contaminated water to one relatively free from nitrates. In several instances, an infant has again become cyanotic when returned to his original feeding formula containing high nitrate water.[13, 61, 66] Bosch, *et al.*,[8] implied that spontaneous recovery should occur in 48 hours after discontinuance of use of a feeding formula containing high nitrate water, while Halpern and Dubost [33] stated that such recovery will occur in 4 days.

In 1939, prior to Comly's hypothesis of high nitrate water-induced methemoglobinemia, Wendel [79] reported on the effectiveness of methylene blue in treating sodium-nitrite-induced methemoglobinemia in dogs. He found that an intravenous injection of 0.1 to 0.2 ml. of a 1 per cent solution (1 to 2 mg.) of methylene blue per kilogram of body weight resulted in a rapid decrease in the methemoglobin level. In studying the molecular ratio of the hemoglobin produced per unit of methylene blue added, he could not explain the reaction on the basis of the reducing action of methylene blue. Thus, he concluded that it was a catalyst which accelerated the rate with which the enzyme systems of the red cells normally reduced methemoglobin to hemoglobin.

Warburg, *et al.*,[74] according to Stafford,[66] found that an overdose of methylene blue may produce methemoglobinemia. However, Finch [26] does not consider this important, since dosages up to 10 mg. per kilogram of body weight do not produce significant amounts of methemoglobin. It is at least significant that intravenous injections of 1 to 2 mg. per kilogram of body weight have resulted in the disappearance of cyanotic conditions in numerous cases in a matter of 30 minutes or less.[11, 13, 23, 24]

In his studies, Wendel [79] also noted that oral administration was effective. Stafford [66] stated the dosage used in oral administration should be 10 to 20 mg. of methylene blue per kilogram of body weight. This is about 10 times the amount used in intravenous injections. He reported favorable results following treatment by oral administration.

Prevention—In general, the prevention of infant methemoglobinemia due to nitrate-contaminated water is largely one of education. If the infant's parents and the doctor in the case are informed of the problem, steps are usually taken to prevent nitrate-induced methemoglobinemia.

Water for use in preparing the infant's formula should contain not more than 10 or possibly 20 p.p.m. nitrate nitrogen.[13, 47] In areas where there is the least question concerning the nitrate content of the water to be used, a sample of that water should be taken and analyzed. If it is high in nitrates, the infant should be retained at the hospital,[66] the feeding should be whole milk without addition of any water,[13] or water having a safe nitrate concentration should be obtained and used in preparing the formula.

An intensive program has resulted in a marked decrease in the reported cases. For example, in Minnesota the reported cases were 55 in 1947, 52 in 1948, but only 12 for the first 6 months of 1949.[8]

In some cases it may be possible to secure a low nitrate water by constructing new wells, properly located and protected from surface contamination. However, this problem appears to require further investigation.

Finally, reporting of methemoglobinemia in infants should be required. Information on the extent of the cases and the regions in which they occur would prove helpful in its prevention.

MORBIDITY AND MORTALITY

Metzler [52] noted that methemoglobinemia is not one of the reportable diseases; and that the cases voluntarily reported are a poor indication of the true incidence. The most complete informa-

tion on the morbidity and mortality among infants due to methemoglobinemia resulting from ingestion of nitrate-contaminated water is the summary of reported cases and deaths included in the report of the Committee on Water Supply, Engineering Section, American Public Health Association.[89] Table 1 reproduces in part these data. It is based on a questionnaire sent to the 48 states and Alaska and Hawaii, to which all but one state replied. Special emphasis was placed on restricting the data to those cases definitely associated with nitrate-contaminated water. Apparently, the reported cases cover a period from 1945, or even earlier, to the dates of the replies to the questionnaires.

A total of over 278 cases and of 39 deaths are noted. Geographically the states reporting cases center around Iowa, where the first case associated with nitrate-contaminated water was recognized. Except for the north central group, only 4 states—California, Georgia, New York, and Virginia—reported cases. Infant methemoglobinemia due to high nitrate waters has also been reported for Canada [50, 59] and Belgium.[24]

Probably the most intensive study of nitrate-induced infant methemoglobinemia is that for Minnesota, which was reported by Bosch, *et al.*[8] It is interesting to note that familiarity with the problem by both physicians and parents apparently has led to a marked decrease in the reported cases.

WATER SUPPLY ASPECTS

Permissible Nitrate-Nitrogen Concentration—The permissible nitrate-nitrogen concentration in water which may cause infant methemoglobinemia when used in a feeding formula is dependent on the individual's susceptibility, the increase in nitrate-nitrogen concentration due to boiling the water, the quantity of boiled water consumed per day per unit weight of the infant, the duration of exposure to the high nitrate water, and possibly other factors.[8, 15, 47]

Comly [13] considered it inadvisable to use well water containing more than 10 or 20 p.p.m. nitrate nitrogen in pre-

TABLE 1

Reported Cases of Nitrate Water-Induced Infant Methemoglobinemia Classified According to Nitrate-Nitrogen Concentration of Water Used in Feeding Formula

State	Methemoglobinemia Reported Cases	Reported Deaths	Number of Cases Associated with Indicated Ranges of NO_3–N Conc. (P.P.M.) 0–10	11–20	21–30	31–50	51–100	100+	No. of Cases for Which Data Are Available	Supplementary Reference
California	1	0	0	0	0	0	1	0	1	
Georgia	6	3	—	—	—	—	—	—	0	Frith [27]
Illinois	75	6	0	1	2	2	12	11	28	
Indiana	1	0	0	0	0	0	1	0	1	
Iowa	Several	11	0	0	0	0	1	1	2	
Kansas	13	3	0	0	1	1	2	8	12	Metzler [88]
Michigan	7	0	0	0	0	0	0	7	7	
Minnesota	139	14	0	2	25		53	49	129	Bosch et al.,[8]
Missouri	2	0	0	0	0	0	0	2	2	
Nebraska	22	1	0	1	0	4	9	8	22	
New York	2	0	0	0	0	0	1	0	1	
North Dakota	9	1	0	1	1	0	0	6	8	
Ohio	0	0	0	0	0	0	0	0	0	
Oklahoma	0	0	0	0	0	0	0	0	0	
South Dakota	Several	0	—	—	—	—	—	—	—	
Texas	0	0	0	0	0	0	0	0	0	
Virginia	1	0	0	0	0	0	1	0	1	
	278+	39	0	5	36		81	92	214	
Per cent of Total			0.0	2.3	16.8		37.8	43.1	100.0	

Principal Source: Progress Report of Committee on Water Supply, A.P.H.A., Water Supply: Nitrate in Potable Waters and Methemoglobinemia. *A.P.H.A. Yearbook* 40, 5:110 (May), 1949–1950.

TABLE 2

High Nitrate Waters, Their Geographical Distribution and Total Reported Cases of Infant Methemoglobinemia

State	Total No. Methemo. Cases Reported [1]	Year	Type of Supply	No. of Samples Examined	Per cent of Samples Examined Indicated NO_3–N (P.P.M.) within 0–10	11–20	21–50	Range 50+	Reference
California	1	—	—	—	—	—	—	—	
Georgia	6	—	—	—	—	—	—	—	
Illinois	75	1946		7,000	80±	←	20±	→	(76)
Indiana	1	—	—	146	←	98.7	→	← 1.3 →	(52)
Iowa	69	1939	Dug Wells	454	66.5	10.6	14.3	8.6	(38)
			Drilled Wells	647	95.5	2.5	1.5	0.4	
			Bored Wells	278	79.5	7.9	7.2	5.4	
		1943	Dug Wells	243	48.5	11.1	12.4	28.0	
			Private Wells						
			< 100′ deep	1,943	←	72±	→	← 28± →	(7)
			> 100′ deep	370	←	96.5	→	← 3.5 →	
Kansas	13	—	Rural Wells	—	67±	←	33±	→	(52)
Massachusetts	0	1948	Private	—	—	←	47 samples	→	(89)
Michigan	7	—	—	2,847	93.0	←	7.0	→	(48)
Minnesota	139	1947–9	Municipal	514	96.9	←	3.1	→	(8)
				2,912	84.9	←	15.1	→	
Missouri	2	—	—	—	—	—	—	—	
Nebraska	22	1948–9	Municipal	416	95.0	←	5.0	→	(83)
			Non-municipal	2,687	79.8	←	20.2	→	
			School	258	95.0	←	5.0	→	
			Farm	275	78.0	←	22.0	→	
New York	2	1943	—	2,864	96.1	3.3	0.6	0.0	(89)
		1944	—	3,528	96.9	2.5	0.6	0.0	
		1945	—	5,117	97.4	1.8	0.7	0.1	
		1946	—	6,524	96.4	2.1	1.3	0.2	
North Dakota	9	—	—	509	84.9	←	15.1	→	(1)
		—	—	287	84.0	←	16.0	→	(72)
Ohio	0		Rural Wells	10,500	90.5	5.0	3.5	1.0	(75)
			State Park Wells	400	100.0	0.0	0.0	0.0	
Oklahoma	0	—	—	415	Av. NO_3–N Conc. = 28 p.p.m.				(89)
South Dakota	Several	—	—	—	—	—	—	—	
Texas	0	—	Rural Wells				Numerous		(89)
Virginia	1	—	Rural Wells	—	—	—	—	—	

1. Includes all reported cases irrespective of the date of their occurrence or the type of water with which they were associated.

paring an infant's feeding formula. Data presented in Table 2 indicate that no cases were reported which were associated with water containing 10 p.p.m. nitrate nitrogen or less, and the nitrate-nitrogen content was less than 20 p.p.m. for only 2.3 per cent of the cases for which data were available. It should be noted, however, that in many of these cases clinical data were insufficient for definite diagnosis, and samples of water for the analysis were sometimes collected several months following the occurrence of the case.

Although 10 p.p.m. nitrate nitrogen has been suggested as the permissible level,[13, 47] the A.P.H.A. Committee [89] points out that most of the cases studied were associated with nitrate-nitrogen concentration in excess of 40 p.p.m. and comments that it is "impossible at this time to select any precise concentration of nitrates in potable waters fed infants which definitely will distinguish between waters which are safe or unsafe. . . ."

Geographical Distribution—The geographical distribution of high nitrate waters is widespread. Twenty of 37 states, which replied to this item on the A.P.H.A. Committee's questionnaire, reported wells yielding water containing in excess of 50 p.p.m. nitrate nitrogen.[89] Results of fairly extensive surveys, indicating the occurrence and concentrations of high nitrate waters, are available in the literature for Illinois,[76] Iowa,[38] Michigan,[48] Minnesota,[8] Nebraska,[83] New York,[89] and Ohio.[75] The available data are summarized in Table 2.

Although the information presented in the literature is insufficient to permit a sound analysis of the problem, it does

indicate that waters of high nitrate-nitrogen concentration occur in a sufficient number of instances to anticipate cases of nitrate water-induced methemoglobinemia in Illinois, Iowa, Michigan, Minnesota, Nebraska, Ohio, Oklahoma, and possibly New York and Texas. The absence of any reported cases of infant methemoglobinemia in Ohio, Oklahoma, and possibly Texas, does not appear to be due to the lack of occurrence of high nitrate waters.

Types of Supply—High nitrate waters have been found most frequently in private wells serving rural homes. However, water containing in excess of 10 p.p.m. nitrate nitrogen has been reported for wells supplying municipal water works in Illinois,[49, 76] Kansas,[52] Minnesota,[8] Nebraska,[83] and New York.[89] Available evidence indicates that surface supplies do not offer a problem except in very unusual cases.[49, 75, 89]

Construction of Wells—Most cases of infant methemoglobinemia have been associated with water from dug wells. Bosch, *et al.*,[8] noted that in 125 of 129 cases investigated the water came from dug wells. Data reported for Iowa [38] show nitrate-nitrogen concentrations over 10 p.p.m. in water samples from 39.7 per cent of dug wells, 21.5 per cent of the bored wells, and only 4.5 per cent of the drilled wells.

The location and physical features, also the nature of the water-bearing strata, may be important. Nearby sources of pollution were believed to be significant by 12 of 22 states reporting on this item in the A.P.H.A. Committee's questionnaire.[89] Bosch, *et al.*,[8] noted that 83 of 129 wells involved in cases of methemoglobinemia were within less than 50 feet from a barnyard, pigpen, privy, cesspool or other source of animal or human contamination. It may be significant to note the marked difference, shown in Table 2, in the percentage of high nitrate waters from school and farm wells in Nebraska, also that between state park wells and rural wells in Ohio.

In many cases farm wells, and particularly dug wells, are inadequately protected against contamination by surface water or water percolating but a short distance through the soil. Thus, as might be expected, several states have reported a high percentage of the high nitrate waters to be positive for coliform organisms.[38, 59, 75, 76] However, there appears to be no relationship between nitrate concentration and bacterial numbers.

Sources of Nitrate Contamination—According to Sarles, *et al.*,[63] the principal sources of nitrogenous matter in the soil are the decomposition products of plants, animals and microörganisms; the liquid and solid wastes of animal metabolism; and fertilizers added to enrich the soil. The possibility of geological formations containing appreciable amounts of nitrates must also be considered.

It may be significant that 12 of 22 states replying to this item on the A.P.H.A. Committee's questionnaire expressed the opinion that nearby sources —barnyards, pigpens, privies, cesspools, etc.—were important in causing high nitrate waters.[89] Such a belief is substantiated by the variation in nitrate-nitrogen content of waters from wells, such as noted by Borts,[7] Maxcy,[47] and in the New York studies.[89] However, Metzler [52] observed only seasonal change in the nitrate content of 4 municipal wells, and Bosch, *et al.*,[8] noted no appreciable variation in the nitrate content of samples taken bi-weekly from each of 5 wells, or in samples from 2 wells taken after more than an hour of continuous pumping. Two wells, a 30-foot dug well and a 71-foot drilled well, were reconstructed in an attempt to exclude nitrate contamination, but no significant reductions in the nitrate content of their waters were noted.

The A.P.H.A. Committee's report [89] notes that high concentration of nitrates

in waters in rural wells, which usually were poorly constructed, shallow, dug wells, did not seem to be associated with nearby sources of pollution. Weart [76] notes that the upper 40 inches of soil may contain 16,000 lbs. of organic nitrogen per acre. Sarles, Frazier, and McCarter [63] discuss the decomposition of nitrogenous matter. Proteins and nitrogenous matter are first hydrolyzed into amino acids or other water-soluble products consumed by bacteria which give off ammonia. Nitrification may occur through the action of *Nitrosomonas* or *Nitrosococcus* bacteria, which in the presence of air oxidize ammonia to nitrous acid; and by *Nitrobacter*, which oxidizes the nitrous acid to nitric acid.

Since bacteria are essential in the production of nitrates from organic nitrogen, factors influencing their activity affect the nitrate content of the soil. Sarles, *et al.*,[63] note that nitrification takes place only when the soil contains buffering substances which neutralize the nitric acid and maintain a pH around 6.5 to 8.0; when aerobic conditions, such as result from plowing, cultivating, etc., are maintained; when soil contains only about 50 per cent of its water-holding capacity; when ammonia salts and other nutrient elements are present in the soil; and at temperatures above 50° and below 100° F.

ANALYTICAL PROCEDURES

There are several procedures by which the nitrate content of water may be determined. Most laboratories use a screening test to differentiate between low and high nitrate concentrations, and then determine the nitrate nitrogen in high nitrate waters by a more accurate procedure.

One nitrate screening test is that developed by Riehl,[75] which he adopted from "Qualitative Analysis by Spot Tests" by Fritz Feigl. Another screening procedure is that developed by Bray [9] and used by Illinois. Both of these procedures are spot plate tests which may be used in the field to prevent overburdening the laboratory with large numbers of samples of low-nitrate waters.

Metzler [52] reports that the brucine procedure is used in Kansas. Local health departments have been equipped with field test kits with which on-the-spot tests are made to determine whether the nitrate-nitrogen concentration is within the 10 p.p.m. limit usually considered the maximum permissible level.

More precise methods for use in the laboratory are the phenol-disulfonic acid and reduction methods as given in *Standard Methods*.[88] Still another method which can be used is the brucine method.[36, 55, 80] For precise work it would seem desirable to use a photoelectric colorimeter for comparing the color developed in samples with that of standard concentrations.

FURTHER INVESTIGATIONS NEEDED

Maxcy,[47] in a report adopted by the Committee on Sanitary Engineering and Environment, Division of Medical Sciences, National Research Council, notes that there is urgent need for further study before comprehensive measures of prevention can be advocated. Such a study should consist of observations in various parts of the United States by the same unit.

Some of the factors which should be investigated are the permissible level of nitrates in waters fed to infants; the factors which predispose some infants to methemoglobinemia, whereas other infants consuming equally high nitrate waters are unaffected; the health of infants routinely consuming water containing high nitrate in regions where methemoglobinemia has not been reported; the fluctuations, if any, in the nitrate content of waters from selected wells, including factors which influence such variations.[47, 89]

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International VD Union Meets

The 28th General Assembly of the International Union against the Venereal Diseases was held in Paris, May 21–25, 1951. It commemorated the 50th anniversary of the founding of the French Society for Moral and Sanitary Prophylaxis by Alfred Fournier. Dr. E. H. Hermans, Netherlands, president of the Union, presided, and Dr. Andre Cavaillon, secretary-general of the Union and the French Society acted as hosts. The Assembly was attended by 52 delegates from 28 countries, as well as by observers from the World Health Organization, the League of Red Cross Societies, the International Abolitionist Federation, the International Alliance of Women, and others.

Much of the Assembly's program was devoted to the discussion of sex education. Among the numerous papers presented was a report by the American Social Hygiene Association on "Progress and Trends in Sex Education in the United States." The agenda also included a joint session of Assembly delegates, doctors, educators, psychologists, and social workers on this subject.

Resolutions unanimously adopted by the Assembly propose the establishment of a Union Liasion Office in the future, possibly in Geneva; and the preparation of a new statement of Union objectives, with program and budget. These resolutions enable the Union to meet today's challenges better equipped to fulfill its responsibilities as the international voluntary agency in its field.

The United States delegation, chaired by Bailey B. Burritt of the American Social Hygiene Association's Executive Committee included: Mrs. Burritt, Dr. Robert H. Bishop, Jr. (A.S.H.A. Executive Committee and Board of Directors) and Mrs. Bishop, Dr. William A. Brumfield, Jr. (deputy health commissioner of New York State and chairman of A.S.H.A. Committee on International Activities), Lt. Col. Louis Kossuth (attached to General Eisenhower's staff in Paris), Irving J. Fasteau (Permanent Attache for Social Affairs, American Embassy, Paris), and Dr. Robert D. Wright (professor of social and environmental medicine, University of Virginia).

Vol. 41

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association, Inc.

Volume 41 August, 1951 Number 8

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COMPARISON OF MORTALITY RATES IN POPULATIONS OF DIFFERING AGE DISTRIBUTION

DR. J. YERUSHALMY, in this issue of the JOURNAL, calls attention (as Woolsey [1] and other authorities he cites have done before him) to the serious errors involved in present methods of comparing mortality rates in different areas, or at different times in the same area, by an adjusted rate based on an assumed uniform age-distribution of population in both areas or at both periods. Such a comparison will obviously depend largely on the age-distribution which is assumed; and almost any result (within limits) can be obtained by the choice of a particular norm. Even more important, as Yerushalmy points out, is the fact that the usual adjusted rates yield distorted results, because they are so heavily weighted by changes of mortality in the ages of 65 years and over, where death rates are relatively high but where their influence on total life expectancy is comparatively slight.

To obtain a more significant basis of comparison, Yerushalmy has developed a method for computing a mortality "index" to allow for differences in age composition of populations. His suggestion involves giving equal weight to relative changes in rates, whereas we ordinarily give equal weight to absolute changes. This, and the recent proposals by Dickinson and Welker [2] and Haenszel [3] to give emphasis to the years of life lost, are distinct additions to the vital statistician's methods for interpreting mortality statistics.

Of 41 registration areas which responded to a questionnaire by Yerushalmy on the subject, only seven were found to adjust their death rates, routinely or at regular intervals, for the purpose of eliminating the effects of changes in the composition of the population. Such minor use of the standardization process probably means that adjustment will generally be made on an *ad hoc* basis, the standard being chosen to suit the particular problem, except in those areas which will adhere to a standard because a long-term series exists. It appears unlikely that we shall see agreement on a single standard, therefore, especially in view of the lack of

agreement on how adjusted rates should be interpreted and even on the basic purpose of adjustment.

Yerushalmy's proposal has not made the task of the statistician easier. His method requires a separate set of weighting factors for each cause of death, which presents a difficult problem to the small statistical office, where the simplest procedures are of necessity most practical. Yerushalmy's "mortality index," further, is not easily explainable to administrators or to the public. On the other hand, without recognizing the components, the public has been exposed to the "index number" idea in other connections.

Dr. Yerushalmy has not finally solved the problem; but he has rendered a very real service by calling attention to the fantastic fallacies which may be inherent in the conventional age-adjusted rate. The values of the newer methods of analysis lie in the fact that they not only attempt to solve the problem, but in so doing contribute valuable additions to methodology. Any such new approach is well worth while. A fruitful area for investigation by vital statisticians now is the proper use of each method and the circumstances under which each should be utilized.

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COÖPERATIVE HEALTH SERVICES FOR SMALL INDUSTRIAL PLANTS

MANY articles have been published on the subject of coöperative health services for small plants, yet there have been only sporadic efforts in the direction of establishing them widely on a firm foundation. With over half our working population in small plants and a national emergency upon us, it is disturbing that probably less than 100,000 small plant workers in this country have really adequate occupational health programs. This is less than 1 per cent of those who could be covered.

Private practitioners, with or without special training in occupational health, have established services for groups of small plants in Burbank, Minneapolis, Philadelphia, and Portland.[1–4] The program in Hartford[5] represents a mixed endeavor in which a physician originally established the service, but turnover in medical direction has made clear that the guiding force for continuity has come unofficially from the Bureau of Industrial Hygiene of the State Health Department. At the Petrie Clinic[6] in Atlanta, too, the original impetus and continuing enthusiasm have come from the State Health Department. Such plans, of course, have been established only where the industrial managements have coöperated and promoted the service. Yet thus far there is little evidence that managers of small industries have recognized their own health service needs, banded together, and offered a physician a stable opportunity to develop and continue a health service. Insurance companies

have given support to these services in certain cases, including financial subsidy during their formative stages, but there is little in the literature to suggest that they have established and maintained them.

Another historical fact about coöperative small plant health services is worth noting. Many have been started by enterprising physicians who have become known through these efforts and have then been attracted to other positions offering more stability, greater opportunity, and better financial return. The history of the Hartford program is of interest. The physician who originally developed a plan for the service went to a large corporation before putting it into effect. The first medical director stayed less than a year before receiving an offer from a university interested in developing an occupational medicine teaching program. The second medical director worked a year and then went to a large rubber company. The third worked two years and was then persuaded to take a full-time position with a state agency in charge of employee health. The fourth worked three months and then went to a large chemical company. The fifth is still on the job.

The cost of these programs has varied. At present it would be hard to offer adequate in-plant service for much less than $20 per employee per year. The figure seems to rise inevitably as the size of the plant decreases. Cost, however, is not necessarily the greatest barrier. The medical directors of successful coöperative programs have shown through the improved overall health of the workers concerned that the money has been well spent. Both compensation insurance premiums and noneffective rates from non-occupational illness have been reduced by the services where men of broad vision have recognized the unity of a worker's health and have provided the stimulus and the follow-up, frequently through a well trained nurse, for the worker to receive definitive care from his own physician for any medical condition discovered in the plant health program.

As has been suggested above, the problem of staffing medical service organizations for small plants is a difficult one. Physicians with adequate training and constructive ideals need a reasonably stable and predictable framework in which to work, and permanent opportunities require a continuity of organizational framework. Existing group practice units, particularly if combined with prepayment (as in the H.I.P. plan of New York), or with new units created specifically for the end in view, could readily be utilized for the development of coöperative in-plant health services. A number of employers in the same part of the city might find it highly advantageous to sponsor on-the-job medical and surgical services. Since they already pay for compensation work, they might offer interested local physicians already doing this work an opportunity to supervise in-plant preventive services. If these were established, with suitable professional advisory boards, so that standardized policies and administrative procedures could be applied where desirable to all medical and health problems arising at the place of employment or elsewhere, the workers could receive the same or a higher quality of care with better coördination of effort, reduction in cost of service, and more effective prevention of disease and early case finding. The extension of hospital and medical insurance to millions of workers in small plants, particularly of course in those states with sickness disability compensation laws, could be utilized to promote efficient, well integrated health services. Groups of employers, at times with the active coöperation of labor unions, could offer the financial backing, perhaps through nonprofit corporations. Medical societies and other professional medical and nursing groups could establish and assist in maintaining professional standards. The visiting nurses' associations

could assist in maintaining standards for the nurses who provide such a vital factor in the success of industrial health programs. Industrial hygiene personnel in health departments, private industry and voluntary agencies could continue to provide leadership in planning as well as in technical phases of the work.

A large number of influential groups would be interested in the provision of health services for the small plant. They include the workers; the physicians; the employers; employers' associations, e.g., chambers of commerce or manufacturers' associations; employees' associations, e.g., labor unions; physicians' associations, especially committees on industrial health; nurses' associations; the local health departments, as well as the state divisions of industrial hygiene; and the voluntary organizations, including visiting nurse associations and voluntary hospital or medical insurance plans.

The concept is sound. The opportunity is there. What is needed is leadership—in planning, in education, in coördination. Who can supply this leadership so logically and effectively as the Health Officer? It is no accident that the two most promising programs now in operation were stimulated and developed by the State Health Departments of Connecticut and Georgia. Other states should follow their example. The same opportunity presents itself to the health departments of industrial cities, large and small.

In the present discussion we have so far been considering primarily the medical aspects of industrial health. Side by side with health supervision of the individual employee, there is essential need for control of those aspects of the working environment which are unsanitary (involving direct threats of communicable disease transmission, poisons, dusts, and the like) or unhealthful (due to the lack of temperature control, illumination or other factors necessary for health in a positive sense). F. A. Patty, in this issue of the JOURNAL, has discussed these objectives and has pointed out that their attainment requires an expert industrial hygienist for each 10,000 workers—an ideal which obviously cannot be approached by any small plant. This advisory function has been recognized as a natural responsibility by most of our state health departments and by those of a few of our larger cities. It could—in many more cities—be admirably combined with health department leadership in securing coöperative medical service for the small plant.

Finally, the small industrial plant offers extraordinary opportunities for the discharge of another basic function of the health department, that of health education. The local representatives of the American Cancer Society have made most promising demonstrations of the possibility of plant education in their special field in Massachusetts and Philadelphia.[7]

In stimulating and assisting the organization of medical services for small industrial and commercial plants, and in providing hygienic counseling and educational programs for all plants, the local health department has a unique opportunity for service. We believe that the Health Officer who responds to this challenge and provides the leadership necessary to develop health service for the small plant will reap a rich reward—in the support of his organization by both industry and labor, and in the consciousness that he has helped to close the major gap in our program for promoting the health and efficiency of industrial workers.

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UTILIZATION OF MEDICAL MAN POWER IN PUBLIC HEALTH

DR. HAVEN EMERSON'S studies for the Committee on Administrative Practice have indicated that there were recently some 1,200 physicians employed as full-time health officers in the local health services of the United States, with about 1,000 other physicians employed as health department medical administrators of various types, a total of 2,200 in all (not including state and federal staffs or those in nonofficial employment).

The nine schools of public health in the United States in the academic year 1949–1950 had a total of 128 medical candidates from the United States for the M.P.H. degree, of whom 78 had already been in some form of public health service. The ten schools in operation during the year 1950–1951 had 102 such medical candidates for the M.P.H. degree, of whom 81 had already been in public health service.

It is reasonably clear that an average of some 115 graduates per year, of whom less than half are new recruits in the field cannot possibly serve to meet a normal routine overturn in a staff of over 2,000 persons, even excluding demands from federal and state staffs and voluntary agencies. That is why, in the recent experience of the American Public Health Association personnel service, we have had 300 applications for medical men, and 36 applications by medical men, for public health posts (a ratio of 8:1). Military demands are certain to deplete our present inadequate staff of public health officials. The need for competent full-time health service as a basic element in civilian defense makes the problem, daily, more serious. If and when a properly framed bill for additional federal aid to the health unit program is enacted, our present deficiencies will become intolerably acute.

Is it not time that we should face this issue and find a solution, instead of pursuing the ostrich policy of hiding our heads in the sand? It is clearly the business of the public health profession to find a reasonable answer—or the public will itself find a less desirable one.

One of the solutions of the problem seems to some of us to lie in a new concept of the desirable size of a local health unit. Dr. Emerson has suggested 50,000 population as the minimum basis for a local health unit; but many such units are actually being installed with populations of 30,000 or even less. The Emerson overall figure of 1,200 full-time health units to cover the United States (instead of the total of 4,500 independent full-time and part-time health departments now in existence) actually corresponds to an average unit size of over 100,000 population. We suggest that the latter figure would be a far more realistic goal than 50,000 in most areas of the country; and that a general decrease of smaller units outside the large cities could be profitably balanced by the development of relatively autonomous districts in the very large communities.

Small areas of jurisdiction make an impossible demand on our supply of medical man power. They also limit the usefulness and decrease the attractiveness of the health officer's position. A unit of 30,000 population—or even 50,000—does not provide any real challenge to a fully trained and able medical administrator. He has not enough to do to keep him busy. A prominent industrial leader has recently been quoted as saying that any occupation which requires active recruitment has something wrong with it and had better be examined to discover the basic reason why it fails to attract suitable candidates. It will be well for us to examine the key position in our public health program with this consideration in view.

It is highly probable that the establishment of health districts of adequate size would, on the one hand, avoid costly waste of medical public health personnel and, on the other hand, raise salary levels and increase satisfaction in achievement, so as to attract more capable candidates into the field. With a medical officer of health in charge of a district of 100,000 population for general overall administration and expert control of specifically medical problems, administration of districts within the total area could be profitably turned over to engineers, public health nurses, non-medical administrators and others.

The writer is quite familiar with the difficulties in the way of securing the establishment of health districts by coöperation between independent governmental units. If, however, a district of 100,000 is the really right solution—and indeed the only feasible solution—let us stand for that policy. If we take such a position, the public and not the health professions must bear the responsibility for future failure.

Clearing House on Public Health Salary Information and Personnel Needs

NEW YORK STATE INCREASES SALARIES

The following is excerpted from a communication from the director of the Office of Professional Training of the New York State Department of Health, Franklyn B. Amos, M.D.:

A general upward reallocation of salaries in medical positions in the New York State Health Department climaxes an almost three-year effort to accomplish this objective. The original request for upward reallocation of these salaries was submitted in October, 1948. Strong arguments for such reallocation were presented, together with the substantiating evidence as to the salaries paid by other progressive departments, industry, unofficial organizations, and the income of positions in private practice. There followed many conferences with Civil Service and Budget officials and members of the Executive Office. An independent survey made by the Department of Civil Service tended to confirm the information submitted by the Department. Approximately 50 per cent of the medical positions in the Department, exclusive of the hospitals and the laboratory, continued to remain vacant in spite of intensive recruitment efforts.

The salary reallocations, together with the cost of living bonus provided by the State Legislature effective April 1, 1951, increases the salaries of medical positions by approximately $1,200 per year. There are vacancies at the present time in the position of assistant district health officer, epidemiologist, and senior public health physician in the entrance grade. These require one year or less of public health training and experience, and a year at a school of public health, or three years of training and experience without the year at the school of public health. A few vacancies exist in the next level positions, from which promotions are usually made to fill the higher positions in the department.

It should be remembered that New York, before this salary upgrading, was already among the states paying the highest public health salaries. It also has an active training program. To be a public health physician may require a certain temperament, but recruitment, training, and reward help.

RECRUITING MENTAL HEALTH WORKERS

Careers in Mental Health has been prepared by the Mental Health Institute of the National Institutes of Health in order to encourage more young people to enter mental health work as a profession. There is one general pamphlet outlining how the professional team of four operates—psychiatrist, psychologist, psychiatric nurse, and psychiatric social worker. This is accompanied by four separate pamphlets, one on each of the professions. They describe jobs, qualifications, and opportunities. In particular, also, they indicate the various sources of financial aid to students. Among these are included stipends available from the National Mental Health Institute to graduate students in the four psychiatric specialties. In view of the growing concern of local health departments with mental hygiene problems, these might be useful recruitment tools in many areas.

Single copies are available from the National Institute of Mental Health, Bethesda, Md. The general pamphlet is 15¢, the others 10¢ each. Quantities from the Government Printing Office, Washington 25, D. C., with a 25 per cent discount on orders of 100 or more.

NEW CIVIL SERVICE PUBLICATION

The National Civil Service League, in June, began publication of *Civil Service Law Reporter*, in order, as its announcement reads, to fill "the need for a comprehensive review and digest of current civil service legislative and ju-

dicial trends." Each monthly edition will be divided into 3 sections: Statutes, Case Law, and Special Articles. Included with the subscription is a leather bound loose-leaf binder for a permanent file of the *Reporter*. The National Civil Service League is "A citizen organization devoted to adoption in government of a modern personnel system based on merit; and to exclusion of partisian control of public employment." The editor of its new publication is H. Eliot Kaplan, Deputy Comptroller of New York State and a member of the State Commission on Pensions. Annual subscription (on a self-sustaining basis), $25. 120 East 29th St., New York 16.

A RECRUITMENT TECHNIQUE

In order to give nurses an understanding of the problems of nursing in rural areas—and perhaps to recruit them for such service—the University of Colorado School of Nursing has initiated a new course, "Rural Community and Hospital Nursing." In coöperation with the County Hospital and the Health Department of Weld County, every senior nursing student will spend six weeks in the county hospital and the county health organizations. Thirty hours a week will be spent in the hospital and one day on field trips, follow-up visits in homes of patients, and participating in community activities. The student will go to meetings of such local groups as 4-H Club, Grange, Farm Bureau and others.

Coördinator of the course is Evelyn Horstman, assistant professor in the School of Nursing. Her headquarters are in the Weld County Hospital, Greeley. It is to be hoped that the project includes provision for recording and analyzing results, so that other schools may benefit by the experiment.

INFLATION AND TAXES STEAL INCOME

The Clearing House is indebted to Franklin B. Caffee, a member of the Subcommittee on Salary Study, for calling attention to "Why The Rich Feel Poor." Appearing in the *U. S. News and World Report* of May 11, 1951, this article says that "taxes take more and costs keep rising." Inflation and taxes, it says, have brought about a nine per cent decline in buying power since the Korean war began. For instance, a married man with two children having a gross income of $10,000 before the Korean war got $8,833; now he gets only $7,959. Those who are particularly losing out to rising prices and taxes are the white collar workers, pensioners, and those on fixed incomes.

Mr. Caffee also sends us from the same source, as of April 13, 1951, "What It Takes Now To Live As Well As You Did In 1939." The man with two children who earned $5,000 in 1939, must now earn $11,000 if he is not on a reduced standard of living. These are facts that have a bearing on the shortage of professional personnel.

The editor of *U. S. News and World Report* is David Lawrence. Its editorial office is at 24th and N Sts., N.W., Washington 4, D. C.

A SPECIAL TRAINING PROGRAM

The National Society for Crippled Children and Adults has organized a series of workshops to help fill the need for specially trained persons to work with crippled children. In a series of 12 specialized workshops in universities and colleges in various parts of the country, special teachers, therapists, administrators and others working with crippled children are given an opportunity to learn more about their jobs.

"There is a great need for professional personnel and one of the greatest barriers encountered in the various state crippled children's societies and crippled children programs is the lack of trained personnel," said Dr. John J. Lee, dean of the graduate school of Wayne University, who, as counselor in special edu-

cation to the Society is planning the workshop program.

SANITARY ENGINEERING AT OHIO STATE

A new curriculum in sanitary engineering at Ohio State University, Columbus, will begin with the fall semester, 1951. The course has been developed as an option in civil engineering and "will lead to the Bachelor of Civil Engineering or the combined Bachelor of Civil Engineering and Master of Science degrees at the completion of five years of study." The first two years will be identical with other civil engineering options. Specialization will commence with the third year of study. A nine week summer training program will be included between the third and fourth years. Three of the nine weeks will be spent at the Summer Surveying Camp and six with the Ohio Department of Health in a field training program devoted to environmental health control engineering. Further information from Kenneth W. Cosens, associate professor of civil engineering.

PERIODIC EMPLOYEE HEALTH CHECK-UP

San Jose, Calif., now requires a periodic medical examination for all city employees—once in three years for those under 45, annually for those above. Multiphysical examinations on a screening basis are given to all employees and questionable cases are given a more complete examination. The city and state health departments coöperate in giving the examinations. Workers are classified into three groups for physical fitness:

A. Acceptable for any type of work.
B. Acceptable for selected types of work.
C. Employable only with specific approval of the health commissioner.

Among other cities that require periodic check-up of some or all of their employees are Cincinnati, Detroit, Louisville, and San Diego.

Credit Lines

UNDERSTANDING HEALTH NEEDS

What people do and think about health services may be as important as the services themselves. At any rate, a present state-wide study, *Health Needs And Health Care in Michigan,* has two parts—one on "The Health of the People" and one on "Opinions and Practices Regarding Health Services." Findings: more medical care is needed throughout the population but the unmet need is greatest in the open country and in villages. One family in five had had some contact with public health service. Nearly two-thirds of those questioned in the study thought their community had no major health problem, and only 10 per cent were able to mention a specific problem.

Three-quarters of the persons interviewed had never heard of "representatives of different organizations getting together in a committee or a council to develop plans for improving health in a community." And of those who had heard of it, nearly a fourth didn't want such an organization or were uncertain about it. There's a challenge for health council missionaries!

The study was made by the regular staff and graduate assistants of the Michigan State College Department of Sociology and Anthropology, whose head is Charles P. Loomis, Ph.D. A Survey Advisory Committee was made up of six members of the Michigan State Medical Society which, together with the Michigan Foundation for Medicine and Health Education and the Michigan Rural Rehabilitation Corporation, provided funds to carry on the survey.

JOURNAL OF GROUP PSYCHOTHERAPY

In April, 1951, the American Group Psychotherapy Association began the publication of the *International Journal of Group Psychotherapy.* It is to be devoted to accurate reporting and interpretation of group therapy as practised both in the United States and in other countries. It will attempt to stimulate the study and validation of current practices.

The Editorial Committee, of which Samuel B. Hadden, M.D., is chairman, is at the Association's headquarters, 228 East 19th St., New York 3. The publisher is International Universities Press, 227 West 13th St., New York 11. Annual subscription is $7.50.

HOW A HEALTH COUNCIL—SIMPLY TOLD

Health Councils for Healthier Communities, a leaflet in red, white, and blue, is published by the Committee on Rural Health of the Ohio State Medical Association (79 E. State St., Columbus 15). It is all one could wish for in a simple pamphlet that will not scare away the ordinary citizen with its professional lingo. It gives 10 guides to health council organizations and 11 items of advice to chairmen. It is a much shorter and less technical job than "Community Health Council," published in 1949 by the Rural Health Committee of the parent organization, the American Medical Association, which may not mean that it has less usefulness. No information as to whether it is available outside Ohio.

NATION MAGAZINE HEALTH SERIES

The Nation, which calls itself "America's leading liberal weekly since 1865," makes its bow to service for public health in two ways. In the issue of June 30, it publishes a page of pictographs on "1951 Polio Pointers," as recommended by the National Foundation for Infantile Paralysis.

In the current pages of *The Nation*

also will be found a series on abuses in the food and drug trades, planned and in some instances written by free lance writer, Leonard Engel.

By the end of June, three articles in the series had appeared as follows:

Poisoned Pork: The Trichinosis Scandal Exposed, Leonard Engel (May 19)
The Chemicals We Eat, Ruth E. Brecher (June 23)
Dangerous Dosage: Hucksters, Laxatives, and Your Health, Leonard Engel (June 30)

Before this reaches the *Journal's* readers, another on "Bread," by Clive M. McCay, will probably have appeared. Currently there is no information as to whether reprints will be available.

The Nation is published at 7 Vesey St., New York 7. $7 per year.

HEALTH HAS MANY FACES

The American Red Cross has many aspects of its services but soil conservation is certainly not directly one. Nevertheless, the lead article in the June, 1951, issue of *The Red Cross Magazine* is "Wealth or Wasteland." The author is U. S. Secretary of the Interior, Oscar L. Chapman. It is a brief and dramatic plea for using our natural resources to conserve rather than destroy. What's more, it's told in terms of the decisions that the ordinary farmer must make. Nor is soil conservation unrelated to health.

Another article, by Howard A. Rusk, M.D., is also about conservation and development—this time of human resources of the handicapped and disabled.

The entire magazine is handsomely produced with excellent illustrations. It's a good way to keep up with the many needs your Red Cross dollar meets. American National Red Cross, Washington 13, D. C.

SAN DIEGO INDIANS ARE PEOPLE

The recent organization of a Physicians' Committee for the American Indian, devoted to securing better health and medical services for American Indians, gives additional point to a story in the June issue of *San Diego's Health*, organ of the San Diego Health Department. It tells how 19 years ago an Indian did not want a public health nurse on the reservation. But recently an Indian hitchhiked 60 miles to get a blood test and x-ray from the Health Department. In those 19 years the San Diego Health Department has acted for the federal government in caring for the Indians on the 18 reservations in the county.

The chief of the county's Bureau of Public Health Nursing, Mary C. Wolking, who has worked with the Indians during the entire 19 years, has held to the principle that "health problems among the Indian people today are no different than any other place in the County." Hence, they have had the same public health nursing and other health services as the rest of the population. Each reservation is visited at least once a month, with home visits stressing the preventive techniques such as good nutrition, immunization, and prenatal care.

And it has paid off. Despite the high incidence of tuberculosis among Indians, there is currently not a known active case on any one of the reservations. No diphtheria has been reported in over 6 years.

WORTH ACQUIRING

National Health Agencies—A Directory of Member Organizations, 1951 presents concise, up-to-the-minute information about the country's major health organizations—their aims, programs, services and structure. Listed also are executive officers and home offices, as well as facts about publications and sources of financial support. A two page foreword discusses the program of the National Health Council, which is the coördinating body for 36 national voluntary organizations, official

agencies and professional societies operating in the health field.

The directory is attractively printed in large type. National Health Council, 1790 Broadway, New York 19, 25¢ each. Reductions for quantity orders.

Community Promotion of Nutrition in Maple Shade, New Jersey is the detailed report of a community nutrition study in a rural township of about 7,000 inhabitants in Burlington County, N. J. In itself it constitutes a pilot study or illustration of how other communities may organize a nutrition, or in fact any other community health program. Says the report, "It was a development which 'just growed' . . . out of the interest that a public health nurse took in her work."

The report, published and distributed by the New Jersey State Department of Health, includes a nutrition bibliography, a reproduction of an exhibit about the study whose sermon is "community organized, community conducted, community produced." The foreword, by Geoffrey W. Esty, M.D., director of the State Health Department's Division of Constructive Health, says, "It is the sincere hope that this report will serve as a useful guide to other communities which may be stimulated to conduct similar community-wide programs." Presumably, the report is available from the department in Trenton.

Eating Problems of Children: A Guide for Parents and Eating Patterns: A Guide for Doctors and Nurses are two recent pamphlets of the National Association for Mental Health. They are based on material in the 13 Child Guidance leaflets of the New York City Committee on Mental Hygiene of the State Charities Aid Association, revised and condensed. They have been planned with the needs of local communities in mind. Many state health departments or mental health authorities have purchased substantial quantities in order to make them available to suitable professional groups and study clubs without charge. Their theme is not new; it is the old but true and tried admonition to *let* the child eat, not *make* him eat. And of course they're illustrated with cute babies. National Association for Mental Health, 1790 Broadway, New York 19, 15¢ each. Reductions for quantity orders.

The Nurse in the Camp Program is the revised edition of *Suggested Standards for Camp Nursing*, first published by the National Organization for Public Health Nursing in 1944. This new up-to-date version has been prepared with the coöperation of the National Health and Safety Committee of the American Camping Association. It is designed to guide the nurse in a camp program to understand her responsibilities and to relate the health program to the overall camp program, to the end that each child may have the maximum benefit of his camping experience. National Organization for Public Health Nursing, 2 Park Avenue, New York 16, 50¢.

ANNUAL REPORTS

The Ohio Tuberculosis and Health Association has put out a very handsome brochure in honor of its 50th anniversary, *Fifty Years Serving the People of Ohio against a Common Enemy—Tuberculosis*. It has a good deal of historical data that it is well not to go unremembered. The simple figures of changing death rates epitomize tuberculosis history in Ohio and in the United States as well: 1910, 150.8; 1950, 20.1.

History has a way of repeating itself. In 1919, with the help of the Tuberculosis Association, an act was passed in the legislature reducing local health units from 2,158 to 168, which latter figure increased gradually to 203 as more municipalities achieved populations of 5,000. Again, in 1951, the Tuberculosis Association was a leading spirit in

the unsuccessful movement to get an act passed that would have reduced 203 jurisdictions to 96. The Ohio Tuberculosis and Health Association, 1575 Neil Ave., Columbus 1.

Virginia's Health is the 1950 report of the Virginia Health Department. Its excellence and the variety of services that it describes serve to underline the loss the state has sustained in the recent death of its health officer, L. J. Roper, M.D.

The report uses photographs and charts effectively to tell the story. Of the state's 100 counties, all but 20 have established full-time health departments, many of them in coöperative multi-county units. Of the 20 without such organized departments, 13 have made appropriations but have been unable to secure personnel.

Report of the Des Moines County Health Department: A Story of Teamwork is significant if for no other reason than that this county has the only local health department in the entire State of Iowa that is hitting on all cylinders. (One other county has a health department but is "woefully short of personnel.") The services in Des Moines County are reported in terms of case histories—the family with typhoid because of bad water supply, the baby with whooping cough because not immunized, poor housing as a factor in a family's illness. Since it is the only local health department the state can point to with pride, the State Health Department is publicizing the report widely in the hope that other communities will work out the necessary coöperation among municipalities necessary in the absence of permissive legislation. With it is used a leaflet on legislation needed to authorize county boards of health. Entitled "On the Road to County Health Departments," it calls the 2,578 local boards of health the "mud roads" in the health picture. And the Iowa farmer knows what a serious handicap mud roads are.

Annual Report for the Year 1950 is a detailed story of both the domestic and international and both soldier and civilian services performed by the American National Red Cross. In this operation of nearly $40 million, the Red Cross had an excess of operating expenditures over income of more than $8 million. The section on the chapters says "Red Cross workers must know their jobs, carry them out with greater efficiency and conviction than ever before, and be prepared to exercise increased ingenuity and competence in all their work." This challenge to chapters might well be a challenge to public health workers as well.

First Annual Report of the Mental Health Commission of New York State's Department of Mental Hygiene is now available. This commission was established by legislative act for a 5 year period beginning in April, 1949. The first task of its members was "to make a sober and comprehensive analysis of the problem that the law had set before them—to construct a plan for mental hygiene in New York State. This *First Report* is a serious state-wide look from the preventive standpoint and as such should be useful in dealing with similar problems in other states. The Director of the Commission is Ernest M. Gruenberg, M.D., New York State Mental Health Commission, 212 State St., Albany 1.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

A Syllabus of Laboratory Examinations in Clinical Diagnosis—*Edited by Thomas Hale Ham. Cambridge, Mass.: Harvard University Press,* 1950. 496 pp. Price, $5.00.

This is an excellent manual of laboratory methods written from the standpoint of familiarizing the medical student with laboratory methods and their use and significance in medical practice. The manual contains a wealth of valuable material, not only for the medical student but for the laboratory worker, for it is very important that the professional laboratory worker understand the implications of laboratory tests relative to diagnosis. It has been prepared by 33 authors or "contributors," each of whom hold positions indicating notable recognition in their fields. The general character of the chapters or "units" verifies the quality of the authors, for while the present reviewers are by no means competent to judge the validity of all details of the broad technical coverage, the general quality of the material both from a technical and literary standpoint is self-evident. The *Syllabus* was reviewed before publication by a list of 66 critics.

The broad coverage is indicated by 27 "units" or chapters divided into (a) Introduction to Laboratory Examinations (3 units), (b) Laboratory Examination of Blood (13 units), (c) Laboratory Examinations Related to the Urinary System (2 units), (d) Laboratory Tests Related to Diseases of the Gastro-Intestinal Tract (4 units), (e) Special Tests Related to Infectious Diseases (2 units), (f) Special Tests Related to Diseases of Metabolism (2 units) and (g) Special Tests Related to Extravascular Fluids (1 unit). Information in various units seems to be well up to date, and statements in each unit are supported by ample references, many of which are from current literature.

The *Syllabus* has been published by the Harvard University Press in low-cost, relatively simple form and composed on the Varityper. While it is perhaps not quite as easy to read as regular typing with its greater variation in letter size and type, it is relatively easy to read and the form and arrangement are excellent. Certain things deserve special attention, such as the uniformity of style and the development of the *Syllabus* especially for the medical student. Each unit has a short index of contents for ready reference (the general summary is a limited one). There are valuable notes on the limitations and interpretation of various findings. The large number of tables and graphs are extremely valuable for rapid resumé of items covered in the discussion and for summary of various findings. Considerable and commendable attention is given to the statistical evaluation of results so important to medical students and others.

C. A. Perry, Joyce Humphrey, and Mary Brownlee

The Practice of Sanitation—*By Edward S. Hopkins and Francis B. Elder. Foreword by Abel Wolman. Baltimore: Williams & Wilkins,* 1951. 423 pp. Price, $7.50.

To appraise this book correctly, it must be judged against the purpose adopted by the authors. In the preface they say: "This text has been developed as a guide in environmental sanitation

procedures for the training of physicians, nurses, sanitarians, and students in sanitary engineering for a career in public health. It seeks to bring together in one volume the pertinent facts comprising sanitation practice as it is today in this country." The claim of the publishers that "you will find all you need to know right here" is extravagant. The book is not, and no one would expect that it could be, a detailed manual of practice in the wide and complex field of environmental control. Rather, as suggested in the foreword, it is an easy reference to the principles and mechanisms of sanitation for either the thoughtful layman or the technologist.

The authors have accomplished their stated purpose admirably. The text is simply and conveniently organized into 14 chapters touching upon all the essentials of sanitation practice except the control of occupational hazards. It is written in a clear, concise and straightforward style; adequately though not profusely illustrated with photographs, charts and tables; and amplified by the citation of some 350 pertinent references. While abstracting the experience and publications of others, the writers accept their responsibility and state their own opinions or what they consider to be the weight of authority, even on controversial questions. One may differ with them on particular points, but all in all their theses are reasonable and conservative.

The relative public health importance of rural and suburban problems is indicated. However, urban and municipal procedures are much the more adequately represented in the text and in the selection of references. The most explicit are the chapters on food, milk and milk products, water supplies, disposal of sewage, and control of stream pollution.

A few minor faults and unfavorable features should be mentioned. Uncorrected typographical errors detract from an otherwise attractive edition. For those who do not have access to an ample library, the reference citations would be more useful if each contained both the name of the author and an indication of the title or subject matter. In the final chapters on administration of sanitation programs, a few more references to articles describing typical organizations and functions of sanitation units in state and local health departments would be helpful.

This volume should be valuable to a variety of groups. Although not a self-sufficient text, it should provide a basis and a framework of information for organized instruction or for informal reading and study. For the experienced worker in sanitation and public health it will be useful as a reference for rapid review, for specific items of information, and for the location of references to more detailed sources.

ROY J. MORTON

Tables of the Binomial Probability Distribution. *National Bureau of Standards, Applied Mathematics Series 6. Washington: Gov. Ptg. Office,* 1949. 387 pp. Price, $2.50.

Public health statisticians often need to expand the binomial distribution for probability purposes when working with small samples, such as comparing a sample rate with a well established rate, or to determine from a sample rate suitable limits for the appropriate universe value. Unfortunately because of the labor involved in the expansion, the normal curve approximation is often employed, even with small samples. The present fairly extensive book of tables of the binomial distribution should remedy this difficulty to a considerable extent. Table 1 gives individual terms of the expansion $(p + q)^n$ to seven decimals for n, going by units from 2 to 49, and for p going by hundredths from .01 to .50. The values for p from .50 to .99 can easily be obtained by

entering the table with q = 1-p. Table 2 gives the cumulative sum of the terms so that probabilities of r or more successes can be read directly.

The tables are a photographic reproduction of earlier mimeographed tables. They are the most extensive tables thus far available and should prove very useful to public health workers. Fairly extensive tables of the Poisson limiting distribution have been available for some time, e.g., E. C. Molina, *Poisson's Exponential Binomial Limit* (New York: Van Nostrand, 1942). Here is the appropriate companion piece.

JOHN W. FERTIG

The Burden of Diseases in the United States—*By Alfred E. Cohn,* and *Claire Lingg. New York: Oxford University Press,* 1950. 129 pp. Portfolio of additional charts. Price, $10.00.

The central theme of this book is by now a commonplace to public health workers. It is the observed fact that in the past seventy years there has been a continuing decline in the communicable diseases of early life, while simultaneously there has been an increase in the chronic and degenerative diseases of the older ages. The authors point out that this increase is a direct result of the larger numbers of persons who live to old age because they escaped the diseases of infancy and childhood. This hardly novel thesis is supported by an elaborate array of statistical data, chiefly in the form of charts. The final section of the book summarizes in chart form the most important causes of morbidity as revealed by five sickness surveys.

The data presented, while not new, are usefully summarized, and could have served as a quick source of reference. Unfortunately, however, the book has been designed in a pretentious, oversized manner which makes it unwieldy to handle. Furthermore, the price is excessive in view of the nature of the contents. A small, simple volume that might have served as a quick source of reference, would have been more useful.

GEORGE ROSEN

Bacterial Polysaccharides: Their Chemical and Immunological Aspects—*By Martin Burger. Springfield, Ill.: Charles C Thomas,* 1950. 272 pp. Price, $6.00.

The author, formerly Organic Chemist to the Bureau of Laboratories, New York, N. Y., has brought together a large amount of documented material on bacterial polysaccharides and has arranged and displayed his material in an admirable manner. His object has been to discuss in organized fashion particularly those polysaccharide substances which are more or less directly related to infection and immunity.

The opening historical chapter is brief, and refers to early work in the field, such as Pasteur's studies on "Gomme de sucrerie." The remaining 14 chapters deal with polysaccharides of mycobacteria, *B. anthracis,* the *Neisseria, Brucella,* etc. Each chapter consists of a historical introduction, a description of methods used in isolating and studying the polysaccharides, a discussion of their chemical, physical and immunological properties, and finally their uses in diagnosis, prophylaxis, etc. The presentation is chronological and consists of digests of the principal published works in each field. The author connects them in a narrative style that is, in general, both interesting and effective.

Chapters 2, 3, and 4 are the largest and, to the writer, of greatest interest, though this is entirely a matter of personal choice. Chapter 2 carries the reader from Friedländer's work on the mucin-like substances of Klebsiella, in 1883, through all of the fascinating and kaleidoscopically brilliant studies on capsular and somatic polysaccharides of the pneumococcus by Avery, Heidelber-

ger, Felton, Goebel, Francis, Tillet and a host of others during the three decades following World War I. Chapter 3 describes the history of gramicidin and a few related bacillary antibiotics, from the observations on bacterial esterases by Eijkman in 1901, through the studies by Avery and Dubos, and finally to the work by Hirst, Meyer, Hobby and many others on hyaluronidase in streptococci and leech extracts in the early 1940's. Chapter 4 covers the long series of splendid investigations on the polysaccharides and other antigens of streptococci by Avery, Heidelberger, Hitchcock, Lancefield, Hirst, Beeson, Goebel and many other luminaries which led to the present system of serological classification of streptococci, as well as to other bright goals.

In the chapter on typhoid bacilli there is an informative section on pyrogens; their origins and nature.

The appendix contains excerpts from original articles by various authors describing in detail methods used in extracting bacterial polysaccharides.

This book is a storehouse of facts and figures on the subjects dealt with, a valuable historical account brightened by the comments, explanations and contributions of the author, and a splendid source book for the student and researcher in the field of immunochemistry. It is attractively published and well edited, bound in Fabrikoid cover, and will enrich the book shelf and the mind of any microbiologist or immunochemist. MARTIN FROBISHER, JR.

Construction and Equipment of the Home. Vol. 3, Standards for Healthful Housing—*By the A.P.H.A. Committee on the Hygiene of Housing. Chicago, Ill.: The Public Administration Service,* 1951. 78 pp. Price, $2.50.

The Committee on the Hygiene of Housing of the American Public Health Association has now completed the third of its trilogy of publications covering Standards for Healthful Housing. This last volume is devoted to *Construction and Equipment of the Home.* The companion volumes, *Planning the Neighborhood,* and *Planning the Home for Occupancy,* have already found their way into current acceptance and application. That the third volume will find an even wider usefulness is an easy prophecy.

The cue to the philosophy underlying the preparation of all three volumes is in the following statements in the Foreword of the third volume, by the guiding spirit and chairman of the Committee, C.-E. A. Winslow:

> We do not need statistical evidence to convince us that a building so flimsily constructed that its floors may collapse, or one that presents obvious fire hazards, is unsafe. We can foresee that badly constructed stairways and unprotected balconies will cause accidents. We know from experience that cross-connections between sewer pipes and water supply pipes produce intestinal disease. Physiological experimentation has demonstrated that human health and efficiency depend directly on thermal conditions which permit sufficient but not excessive heat loss from the body as a whole and from different vertical levels of the body surface; and the atmospheric conditions which permit such a rate of heat loss can be defined—for a given rate of metabolism and physical activity—with mathematical precision. Similar studies in the field of lighting make it possible to define within narrow limits the illumination levels necessary for common household tasks.

This final volume covers a number of special problems of prime interest to the lay citizen and professional worker, as the country is confronted for decades in the future with housing problems. The subjects, covered by specialists in various fields, run the spectrum from the structural framework of the house; through the basic problems of heating and ventilation, illumination and noise control; sanitation; equipment and safety; facilities for food handling and laundering; factors controlling home accidents; and legal and administrative standards.

Chapter VIII, dealing with this last phase of housing construction, is a "must" for any intelligent reader. It sets forth in detail the general mess into which the average American city, county or state has put itself with some 2,200 dissimilar local building codes, outmoded in many instances, insufficient in others, and inappropriate in still others. The existence of these codes presents one of the major blocks to large-scale production of new materials or to the development of new construction methods.

The volume holds out important hopes for ultimately reducing the cost of the average dwelling by rationalizing rules and regulations, by developing new materials and techniques, and by modifications both in the organization of the building industry and in the principles and practices of financing.

This is a fascinating document to read and if I had my way, it would be on the reading list of every high school and college student. The professional who ignores it is just not keeping up with his work and his responsibility.

ABEL WOLMAN

Industrial Health and Medical Programs—*By Margaret C. Klem, Margaret F. McKiever, and Walter J. Lear. P.H.S. Publication No. 15, FSA. Washington: Govt. Ptg. Office,* 1950. 397 pp. Price, $1.00.

In industrial terms, here is a mine of information on the subject of Industrial Health and Medical Programs. It represents the first attempt of the Division of Industrial Hygiene of the Public Health Service at assembling material on this subject and, as Surgeon General Scheele states, "should be useful to all those concerned with any aspects of the health of working people."

This reference book consists entirely of direct quotations from the various sources listed, including carefully chosen statistical data, tables and charts. The authors, under the general supervision of the Chief and Assistant Chief of the Division of Industrial Hygiene of the Public Health Service, are to be complimented on this compilation and organization of factual material, and the book may be warmly commended to the attention of industrial executives, medical directors, physicians, dentists, nurses, engineers, chemists, and other professional and lay personnel in industry, as well as to federal, state, and local public health workers.

The material in this reference guide has been helpfully organized by the authors into eight sections, among the most interesting of which are those on the Historical Development and Present Scope of Industrial Health and Medicine in the United States; Types and Extent of Plant Health and Medical Services; and General Medical Care Plans.

This handy reference manual is well printed and bound in much the same style as are other paper-covered documents of the U. S. Government Printing Office.

LEVERETT D. BRISTOL

Manual for Water Works Operators—*Texas Water Works and Sewerage Short School (3rd ed.). Austin, Tex.: Texas Water & Sewage Works Assn., 501 West 33 Street,* 1951. 509 pp. Price, $4.50.

This work of 30 authors, with its many illustrations, was prepared under the direction of a committee composed of L. C. Billings, acting as Editor, W. S. Mahlie, D. W. Robinson and V. M. Ehlers. Though it contains a great deal of highly valuable material, it suffers from the usual defects that occur when many individuals, working separately, prepare a textbook. There are overlapping and occasionally non-uniform presentations; and some areas of the field are inadequately treated. Also, the text is quite distinctly slanted to the problems of the Southwest.

The defects mentioned are minor,

however, in comparison with the general value of the information contained, and we believe every water works engineer should have access to this book. We would go further and say that every engineer employed by a department of health should have it. The appendix, "Emergency Operations," is worth the price of the book; and the sections on "Safety Measures," "Algae," "Sanitation of Surface Supplies," and "Ground Water Supplies" are outstanding.

W. A. HARDENBERGH

Parasitic Infections in Man—*Edited by Harry Most. New York: Columbia University Press,* 1951. 229 pp. Price, $4.50.

This book consists of fourteen papers read at a symposium of the Section on Microbiology of the New York Academy of Medicine in 1949. It presents authoritative points of view on recent developments in the study of the biology, biochemistry, physiology, metabolism, growth requirements, immunology, diagnosis, and chemotherapy of the important protozoan and helminthic infections of man.

It is impossible in a brief review to summarize the wealth of material contained in these papers. In the introduction, P. F. Russell reviews the tremendous burden which these infections impose upon the world, the great need for the application of present knowledge in combating them, and the beginning progress which is being made by the World Health Organization and other agencies in raising the standards of health in the tropics. The second chapter, by C. G. Huff, deals with the pre-erythrocytic and exo-erythrocytic stages of the malaria parasites of birds, monkeys and man. The third chapter, by J. T. Culbertson, reviews the immunological mechanisms, and the fourth chapter, by J. Bozicevich, discusses the immunological diagnosis of parasitic infections. In chapter five, N. R. Stoll reviews the diagnostic methods of stool examination for parasites, with particular emphasis on the helminths. Chapter six, by W. W. Frye, describes progress in the cultivation of *Endamoeba histolytica,* particularly the accomplishment of cultivation in the absence of actively multiplying bacteria. In chapter seven, T. von Brand discusses the physiology of the blood flagellate protozoa, and in chapters eight and nine R. W. McKee and Q. M. Geiman present studies on the biochemistry, metabolism and cultivation of malarial parasites. Chapter ten, by E. Bueding, deals with the metabolism of helminths, with particular reference to the schistosome and filaria worms. In chapter eleven, H. H. Anderson discusses the pharmacology and clinical application of amebicides, with particular reference to the thioarsenites. The last three chapters also deal with chemotherapy, G. R. Coatney discussing the newer synthetic antimalarials, H. W. Brown the therapy of intestinal helminths and filariasis, and F. J. Brady the unsatisfactory status of the treatment of schistosomiasis.

This book is a notable contribution and should be in the hands of everyone interested in research on parasitic diseases. HENRY E. MELENEY

Microbiology. General and Applied—*By William Bowen Sarles, William Carroll Frazier, Joe Bransford Wilson and Stanley Glenn Knight. Madison, Wis.: Harper,* 1950. 493 pp. Price, $4.50.

Here is a book that will interest those who would like to see what is being taught in an elementary course on microbiology at one of our institutions noted for the fine character of its work in this field. While it is regarded as a first edition, five previous mimeographed editions have been used and revised in previous years in the development of this text. In the introductory part, the field covered is indicated by chapters

discussing Bacteria; Rickettsiae, Filterable Viruses and Bacteriophages; Algae; Molds; Yeasts; Protozoa; and specialized groups of Bacteria that are related to the more highly developed forms of life.

After Parts 2 and 3 that cover the Physiology of these microörganisms and Methods for studying them, there are parts dealing with Industrial, Soil, Sanitary and Food Microbiology. Part 8 deals with Infectious Diseases of Animals and Plants and this is followed by a concluding part outlining the History of Microbiology. Appendix A gives a general classification of microörganisms and related forms of life. This is followed by the Outline used for Bacteria in *Bergey's Manual of Determinative Bacteriology* and the *Classification of Yeasts and Yeast-like Fungi* according to Skinner, Emmons and Tsuchiya. To one who studied elementary microbiology before the turn of the century, this book gives a summary of the amazing development that has taken place during a lifetime. ROBERT S. BREED

The Public Welfare Directory, 1951. *Chicago: The American Public Welfare Assn.* 365 pp. Price, $5.00.

The American Public Welfare Association, Chicago, is to be congratulated for the Public Welfare Directory in its present edition, representing the twelfth annual edition. Included are listings of public agencies or agencies expending public funds. Regional personnel having frequent contacts with state welfare departments are also included and the listing goes down in most cases to the city and county level. There is a section on Canada, which includes the National Department of Health and Welfare, provincial departments, and local agencies serving cities of over 10,000 population.

Although primarily intended for the use of public welfare officers and to promote the exchange of official information, this *Directory* is very useful for public health officers, especially for information applicable to the national level. REGINALD M. ATWATER

Nutrition and Chemical Growth in Childhood. Vol. III, Calculated Data—By Icie G. Macy. *Springfield, Ill.: Charles C Thomas,* 1951. pp. 1463–2174. Price, $8.00.

With space in scientific journals at a premium, it has become impossible to publish detailed data in many given journal reports. Yet all workers know that valid data are useful for many purposes in addition to those of the original report. The publication of the series *Nutrition and Chemical Growth in Childhood* has placed at the disposal of all the correlated data on measurement of growth, bone growth, energy consumption, and retention of minerals and nitrogen by a group of children studied over many consecutive months. This newest volume of the series contains all calculated values obtained from the original data reported in Volume II. Data are given for successive studies and cumulated for the series.

These volumes are not for the casual reader, but should be at hand in every department of pediatrics and for every student who deals with problems of human growth or of nutrition in childhood. As a source book of values to be expected in normal children of a given age, and to show the variability of one child over a period of months, as well as the variability of response to a diet among several children, these books are invaluable. Volume III with its summarized data of long-continued studies, enhances greatly the value of the series. GENEVIEVE STEARNS

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

AIR POLLUTION CONTROL. Stanley Scott and John F. McCarty. Berkeley: Bureau of Public Administration, Univ. of California, 1951. 38 pp. Price, $1.00.

BALANCE AND RHYTHM IN EXERCISE. Maja Carlquist and Tora Amylong. New York: Viking, 1951. 144 pp. Price, $3.50.

BETTER NURSING. A Study of Nursing Care and Education in Washington. Jean A. Curran and Helen L. Bunge. Seattle: Univ. of Washington Press, 1951. 174 pp. Price, $3.00.

CARE AND HANDLING OF GLASS VOLUMETRIC APPARATUS. Toledo, Ohio: Kimble Glass, Box 1935, 22 pp. Free.

CELIAC DISEASE, MANAGEMENT OF. Sidney V. Haas and Merrill P. Haas. Philadelphia: Lippincott, 1951. 188 pp. Price, $5.00.

CHEMISTRY AND ACTION OF INSECTICIDES. Harold H. Shepard. New York: McGraw-Hill, 1951. 504 pp. Price, $7.00.

CLINICAL TROPICAL MEDICINE. R. B. H. Gradwohl, Luis Benitez Soto and Oscar Felsenfeld. St. Louis: Mosby, 1951. 1647 pp. Price, $22.50.

CONTROL OF CROSS INFECTION IN HOSPITALS. The Cross Infection in Hospitals Committee of the Medical Research Council. London: His Majesty's Stationery Office, 1951. 49 pp. Price, 1s. 9d net.

DESTRUCTIVE AND USEFUL INSECTS (3rd ed.). C. L. Metcalf and W. P. Flint. Revised by R. L. Metcalf. New York: McGraw-Hill, 1951. 1071 pp. Price, $10.00.

FIGHT AGAINST TUBERCULOSIS IN DENMARK. Issued by the National Association for the Fight against Tuberculosis. Copenhagen: NYT Nordisk Forlag Arnold Busck, 1950. 133 pp.

FOOD PURCHASING GUIDE FOR GROUP FEEDING. Rosalind C. Lifquist and Edith B. Tate. Washington: Gov. Ptg. Office, 1951. 95 pp. Price, $.25.

GOVERNMENTAL REORGANIZATION. First Partial Report of Assembly Interim Committee on. H. F. Scoville, H. E. Bachtold, *et al.* Sacramento: State of California, 1951. 365 pp.

GROUP LEADERSHIP AND DEMOCRATIC ACTION. Franklyn S. Haiman. Boston: Houghton Mifflin, 1951. 309 pp. Price, $2.50.

HELP YOURSELF GET WELL! Marjorie McDonald Pyle. New York: Appleton-Century-Crofts, 1951. 235 pp. Price, $3.00.

HOPE AND HELP FOR THE ALCOHOLIC. Harold W. Lovell. New York: Doubleday, 1951. 218 pp. Price, $2.75.

HUMAN RELATIONS IN THE CLASSROOM. Course III (Recommended for the 8th or 9th Grades). H. Edmund Bullis. Wilmington: Delaware State Society for Mental Hygiene, 1404 Franklin St., 1951. 250 pp. Price, $3.00.

INDUSTRIAL WATER POLLUTION. Survey of Legislation and Regulations. Compiled by R. S. Aries & Associates. New York: Chemonomics, 1951. 145 pp. Price, $5.00.

INTRODUCTION TO MOTHERHOOD. Grantly Dick Read. New York: Harper, 1951. 99 pp. Price, $1.75.

MENTAL HOSPITALS, 1950. Proceedings of the Second Mental Hospital Institute in St. Louis, Mo., October 16–19, 1950. Washington: American Psychiatric Association, 1951. 214 pp. Price, $2.50.

MENTAL HYGIENE (2nd ed.). Lester D. Crow and Alice Crow. New York: McGraw-Hill, 1951. 433 pp. Price, $4.50.

MODERN DIETETICS. Doris Johnson. New York: Putnam, 1951. 529 pp. Price, $4.95.

MULTIPLE SCLEROSIS. Application of Rehabilitation Techniques. Edward E. Gordon. New York: National Multiple Sclerosis Society, 1951. 54 pp. Free to physicians and physical therapists upon receipt of a written request.

MUNICIPAL YEAR BOOK 1951. Edited by Clarence E. Ridley and Orin F. Nolting. Chicago: The International City Managers' Association, 1951. 588 pp. Price, $10.00.

NUTRITION FRONTS IN PUBLIC HEALTH. Icie G. Macy, Benjamin H. Ershoff, Clive M. McCay, Ernest Simonson, Howard A. Schneider, and Leo T. Samuels. New York: National Vitamin Foundation, 1951. 168 pp. Price, $1.50.

OPERATION OF SICKNESS BENEFIT PLANS IN COLLECTIVE BARGAINING. Res. Rep. No. 84. Fred Slavick. Princeton: Princeton University, 1951. 109 pp. Price, $2.50.

ORGANIC CHEMISTRY, AN INTRODUCTION TO (7th ed. rev.). Benjamin Harrow and Percy M. Apfelbaum. New York: Wiley, 1951. 480 pp. Price, $5.00.

PAPAIN, M. L. Tainter *et al.* Annals of the New York Academy of Sciences. Vol. 54, Art. 2, pp. 143–296. New York: New York Academy of Sciences, 1951. 154 pp. Price, $3.00.

PHYSICAL EDUCATION. Delbert Oberteuffer. New York: Harper, 1951. 374 pp. Price, $3.50.

PLANNING FOOD FOR INSTITUTIONS. Rosalind C.

Lifquist and Edith B. Tate. Washington: Gov. Ptg. Office, 1951. 95 pp. Price, $.45.

PSYCHIATRIC NURSING PERSONNEL. Washington, D. C.: American Psychiatric Association, 1951. 32 pp. Price, $.60.

SUPERVISION OF PERSONNEL. John M. Pfiffner. New York: Prentice-Hall, 1951. 454 pp. Price, $6.00.

SWIMMING POOL DATA & REFERENCE ANNUAL, 1951 (19th ed.). New York: Beach & Pool, 1951. 144 pp. Price, $3.00.

TOWARD NEW TOWNS FOR AMERICA. Clarence S. Stein. Chicago: Public Administration Service, 1951. 245 pp. Price, $5.00.

UNIVERSITY PROGRAMS IN HOSPITAL ADMINISTRATION. May 4–6, 1950. Summary of a Conference of. Battle Creek, Mich.: W. K. Kellogg Foundation, 1951. 36 pp.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Two Pointed Quotes—"The value of the drugs prescribed by every (British) practising physician last year averaged £1,810—a sum higher than his average income. (One third of all prescriptions were for proprietary medicines.)" And then, this: "If public health can only . . . prevent a little of the 'cascades of medicine' going down the public throat, it will save its cost several times over. (N.B. The business of preventive medicine is to 'prevent medicine.')"

ANON. Administrative Problems of the National Health Service. *Pub. Health* 64, 7:129 (Apr.), 1951.

People Still Are Human—Reported upon here is a scheme of inservice, institutional training for public health nurses to give them a little more insight into the emotional complications suffered by the people they deal with in the field, in homes, or in clinics. It's too bad such unusual educational opportunities are to be open only to nurses.

BURNETT, F. M., *et al.* Learning the Mental Health Approach Through the Chronic Mental Patient. *Pub. Health Nursing* 43, 6:319 (June), 1951.

Group Leadership Does It—Because obesity is a psychologic as well as a nutritional problem, the crux of the matter of girth control is finding ways to move people to want to be *and to stay* thin. This is the story of weight reduction through group therapy.

CHAPMAN, A. L. Weight Control—A Simplified Concept. *Pub. Health Rep.* 66, 23:725 (June 8), 1951.

Born Protected—Almost half the mothers-to-be nowadays are no longer immune to diphtheria and about a third are vulnerable to whooping cough. Hence their babies are similarly susceptible. Immunization during the third trimester protects the newborn until three or four months of age, when active immunization may be more effectively carried out.

COHEN, P., *et al.* Prenatal Multiple Immunization. *J. Pediat.* 38, 6:696 (June), 1951.

Old Story Worth Retelling—An R. A. F. Officer brought smallpox home from India to Brighton. What the British local health officials did to stop the epidemic is told in complete detail. Twenty-nine cases developed and 10 died, though 89,000 people were vaccinated.

CRAMB, R. Smallpox Outbreak in Brighton, 1950–1951. *Pub. Health* 64, 7:123 (Apr.), 1951.

So Doctors May Doctor—If physicians could be relieved of administrative details not involving medical judgments, it would stretch our limited medical man power a little and make public health jobs more attractive to other doctors. This is the burden of a broad study of health activities.

GRANING, H. M., *et al.* Activities of Medical Administrators in State Health Departments. *Pub. Health Rep.* 66, 20:619 (May 18), 1951.

A Lesson Here for You—"Case finding through mass communication mediums unfortunately requires dealing with a group of people that are not readily identifiable as to levels of education, economic status, or patterns of behavior. It is necessary, therefore, to study known patients to . . . establish a composite picture of the group we are trying to serve." (The adjective indicating the kind of patient discussed here is omitted because this royally ignored truism applies to *all* our publics.)

GRAY, A. L., *et al.* Case Finding Through an Understanding of Known Syphilitic Patients. *J. Ven. Dis. Inform.* 32, 6:144 (June), 1951.

About Mumps—Subjecting four painstakingly scientific studies to the indignity of a one sentence comment descends beyond the nadir of digesting—if passing the ultimate, in either direction, is possible. Well, it seems that susceptibility to mumps is measurable and that vaccination with inactivated virus will produce a fair degree of temporary immunity in those susceptibles who should be protected.

HENLE, G., *et al.* Studies in the Prevention of Mumps. *J. Immunol.* 66, 5:535 (May), 1951.

"I-See"—Mostly this is in support of the museum method as a teaching device. The paper is addressed to school people, but this is a subject which every health worker should at least have thought about, so it will do all of us good to expose our minds to the pros of the argument.

GEBHARD, B. What Is Good About a Health Museum? *Nation's Schools* 47, 6:39 (June), 1951.

Skeptics Answered—Every so often someone, with eyebrows raised, asks: "Who reads health tracts anyway?" In this reported-upon study, some students were asked to take selected booklets home to their parents. The parents were quizzed, and two-thirds of those who had seen them had read the pamphlets. Before-and-after tests indicated that they had learned something in the bargain.

KONHEIM, B. G., and NAIMAN, D. N. Free Health Literature—How Effective Is It? *Research Quart.* 22, 1:28 (Mar.), 1951.

You Will Enjoy This—There have been lots of studies which show that white cells gobble up bacteria whenever they have a chance, but I have never seen such dramatic pictures of this process as Smith, *et al.* present, and they actually show it occurring in blood vessels. It is a sort of "cops and robbers" picture. (Contributed by a friend.)

SMITH, M. R., *et al.* Surface Phagocytosis *in Vivo*. *J. Immunol.* 66, 7:71 (July), 1951.

"It is Good to Live and Learn"—This was certainly news to me: "The important fact is that diabetes is not, as formerly taught, a disturbance in the ability of the tissues to utilize sugar. It is primarily a disturbance in the regulation of the blood sugar level by the liver." It isn't due necessarily to a deficiency of insulin: it may be due to an excess of an opposing hormone.

SOSKIN, S. The Role of the Liver in Diabetes. *Quart. Bull., New York City Dept. of Health* 19, 1:4 (Spring), 1951.

Now It's Nutrition—Though only a

beginning has been made in the study of the impact of nutrition upon chronic disease, what little is known should be put to public use by health workers. Present knowledge and needed investigations are briefly noted.

VILTER, R. W., and THOMPSON, C. Nutrition and the Control of Chronic Disease—Public Health Aspects. *Pub. Health Rep.* 66, 20:630 (May 18), 1951.

From a Low Back Clinic—Three danger periods when poor body mechanics are likely to develop are: (1) when the child first goes about vertically, (2) in the teens, and (3) after any prolonged illness. What to do about minimizing the several dangers is discussed in satisfying detail.

WEBER, S. Posture and the Nurse. *Pub. Health Nursing* 43, 6:325 (June), 1951.

Motion Picture Film Reviews

HOMER N. CALVER, *Film Review Editor*

Heredity and Environment. Influences that shape human lives. 16 mm. Sound. 13 minutes. Black and white; also color version. Produced by Coronet Films, 65 E. South Water Street, Chicago 1, Ill. Purchase price for black and white print, $50; color, $100. For rental, consult film rental libraries.

This film apparently is intended as an introduction to elementary psychology for high school students. If that is so, it well fulfills its task of orientation and motivation. The basic concepts of heredity and environment are stated simply, succinctly, and cogently. The film also asserts that the individual helps to influence the development of his life by his own influence on the environment. Granting that little can be done, for the present, with the mechanism of heredity, the film makes it quite clear that the environment is flexible, the most flexible factor in human growth. This is a wholesome emphasis.

Although it remains to be seen how audiences will be affected by this film, professional health workers might use it as an introduction to almost any discussion of environmental health. It is particularly successful in presenting the power of environmental influences and in suggesting improvement of the environment.

Unfortunately, the film does little if anything to show specifically how structural factors in the environment affect public health, comfort, or psychology. This lack raises the question of need for films which show how air, water, food, shelter, and other environmental forces relate to individual and social growth.

Motion pictures as an educational medium should be fitted to the educational process as a whole. Motion pictures hold attention, summarize basic knowledge, and visualize information sometimes better than firsthand experience. But the motion picture is seldom successful at presenting a complex thought. It is symptomatic of this failing that speeches in a good motion picture rarely go beyond a single sentence and that scenes shift every few seconds. For this reason, films are necessarily supplementary rather than primary in education. Health education will continue to need the teacher, the demonstrator, and reading matter. As health education acquires more of these, it will have use for more motion pictures, too. MARK D. HOLLIS

Pattern for Survival. Civilian defense in case of atomic attack. 16 mm. Black and white; also color version. Sound. 20

minutes. Produced by Cornell Film Company, 1501 Broadway, New York 18. Purchase price for black and white print, $100; color, $200. Can also be rented through local distributors and film rental libraries.

Pattern for Survival shows what civilians should do to protect themselves during atomic bombing. It is introduced by William L. Laurence, science editor of *The New York Times* (the only newspaperman to be an official witness of the development of the A-bomb), and narrated by Chet Huntley, radio commentator, who also appears in the movie.

In the main, the film is a faithful visualization of directives and factual material coming out of Washington to date. It never overdramatizes nor does it underplay the seriousnes of atomic bombing, which is its principal subject.

Quite suitable for lay audiences, this film, like all educational films, should be accompanied by a competent authority who can answer audience questions specific to the locality. (In Southern California, where there are few home basements, the primary shelter in this film, the speaker would have to explain substitute possibilities.)

Some authorities may find minor points of difference with this movie—e.g., what items should be included in an emergency suitcase kept in the basement or other shelter—but these points do not weaken the film; rather they should prove excellent discussion starters for the speaker.

The time limitation of the film, and the multitudinous number of points included in medical aspects of civil defense, necessarily exclude many items. This movie concentrates primarily on survival of the individual, which is as it should be for a movie to be put into mass use. It shows how to drop, how to cover the face, how to secure the home, where to get shelter at home or office or in town, and describes the expected damage. It covers both the sudden attack and the attack with warning. But the survival of the individual requires coöperation of the group, and not too much emphasis is laid on this.

Today the civil defense worker is faced with two problems: (1) informing his community for self protection, and (2) recruiting volunteers. For the first problem, this film will be one excellent tool. For the second, in lieu of a Pearl Harbor incident, we can only hope other films will be made.

GEORGE M. UHL

Steps of Age. Mental health for the aging. 16 mm. Black and white. Sound. 25 minutes. Produced for the Mental Health Film Board and the State of South Carolina. Distributed by International Film Bureau Inc., 6 North Michigan Avenue, Chicago 2, Ill. Purchase price, $95. Can be borrowed from some state and local mental health organizations. For rental, consult local film rental libraries.

The distributor announces, "This film is designed so that all people will understand that they must begin early in life to adjust to the problems which all human beings must face when they grow old." This is an extremely broad objective. We doubt that it can be reached by simply showing a film—even this one, which has the artistry to stir emotions more deeply than do most motion pictures. But because it is emotionally moving, the film is a valuable tool in an educational program.

It will be particularly useful in training persons who work professionally with people who are trying to prepare for growing old or to adjust to older people. These persons would include physicians, social workers, nurses, and people engaged in adult education and vocational guidance.

The story deals primarily with elderly persons afflicted with deep depressive elements in their personalities. In this sense it does not depict the usual severe problems of aging. This is one reason why expert psychiatric knowledge might be necessary in leading discussion around

the film. There is a doubt in our minds as to whether this film is useful for nonprofessional audiences without an expert discussion leader present.

How individuals might find solutions to the problem of aging is scarcely approached and there is no hint of the kinds of community services which could help. This is another indication of the need, when Steps of Age is shown to lay groups, to include on the program a speaker competent to discuss questions which the film will certainly stimulate.

The story treatment and the acting are so well done that one can overlook minor technical imperfections of photography and submersion of dialogue in background music and noise.

KENT A. ZIMMERMAN
ANN WILSON HAYNES

Circulation. 16 mm. Black and white; also color. Sound. 16 minutes. Originally produced by Gaumont-British Instructional Films, this film has been reëdited and renarrated by the Educational Division of United World Films, 1445 Park Avenue, New York 29, N. Y., from which prints can be purchased. Black and white, $75; color, $150. Available for rental at $2 a week plus shipping charges from a number of local affiliates of the American Heart Association.

A living heart pumps at the center of a very complete animated syste of drawings depicting the systemic and pulmonic circulations, with close-ups disclosing the exchanges that occur through the capillaries of both. The animation of pulsations in the small vessels gives just the right feel, the venous valves are excellently shown, and the papillary muscle function is not overlooked. The pulse wave before and after exercise is shown being taken on a perfectly working Dudgeon's sphygmograph, and the cardiac cycle is carefully analyzed.

The story is well done and is essentially accurate with some minor exceptions. In demonstrating palpation of the radial pulse, the observer's fingers are placed over the midline of the lower forearm; the otherwise anatomically accurate diagramming of the human circulation shows only two pulmonary veins; and from the animation one gets the impression that the arteries are empty between beats. There is no reference to the action of skeletal muscles or other forces that return blood to the heart.

The film has instructional value for high schools, for the general public, and perhaps for introductory courses in colleges and schools for nurses' training.

The photography and sound are excellent but the film is too long for what it says. There is excessive repetition and review in the animations, and one wonders why every step taken by the exercising subject through five complete round trips down and up a flight of stairs had to be photographed to introduce the effect of exercise on the pulse.

In spite of its superior photography the film leaves the impression that it is old. This is due even more to what is absent than to what is portrayed. Missing, for example, is any reference to the electrocardiogram, intracardiac conduction, and regulation of the heartbeat. One sees no red corpuscles flowing through real capillaries and no real valves straining under exciting illumination and daring photography. There are no heart sounds to accompany the closing of animated drawings of valves, to say nothing of x-ray pictures of the very heart that you are hearing—all of which are already on films that have been available for a decade.

ARTHUR H. STEINHAUS

ASSOCIATION NEWS

SEVENTY-NINTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
SAN FRANCISCO, CALIF., OCTOBER 29–NOVEMBER 2, 1951

THE PRELIMINARY PROGRAM WILL APPEAR IN THE SEPTEMBER JOURNAL

HOTEL RESERVATION FORM

MAIL TO: A.P.H.A. Housing Bureau
Room 200, 61 Grove Street
San Francisco 2, Calif.

Single rooms are very scarce. Please indicate if you would be willing to share a twin-bedded room with another member.
Yes ..... No .....

PLEASE MAKE RESERVATIONS NOTED BELOW:

First Choice ..... Hotel
Second Choice ..... Hotel
Third Choice ..... Hotel

Arrival: ....., at ..... a.m. ..... p.m.
Departure: ....., at ..... a.m. ..... p.m.

..... Single room @ $ .....
..... Double room @ $ .....
..... Twin-bedded room @ $ .....
..... Parlor, bedroom suite @ $ .....

NAMES OF ALL OCCUPANTS:

.....
.....
.....

ADDRESSES:

.....
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.....

CHECK FOR $..... (MADE PAYABLE TO A.P.H.A. HOUSING BUREAU) IS ENCLOSED TO BIND THIS RESERVATION.

MAIL CONFIRMATION TO: Signed: .....

Address: ..... City Zone State

A STAMPED, SELF-ADDRESSED ENVELOPE WOULD BE APPRECIATED.

[1023]

79TH ANNUAL MEETING

San Francisco, Calif., Oct. 29–Nov. 2, 1951

A HOUSING BUREAU has been organized for the 79th Annual Meeting of the A.P.H.A. in San Francisco, October 29 to November 2. Since all requests for rooms are handled in chronological order, it is recommended that you send in your application as quickly as possible.

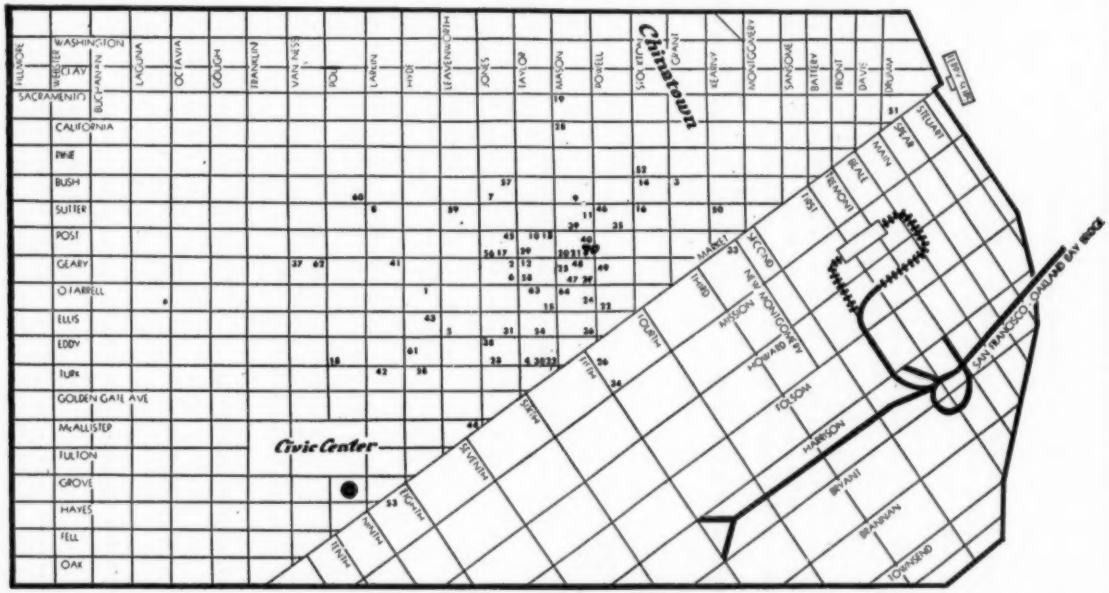
PLEASE COMPLETE THE APPLICATION FORM ON PAGE 1023 GIVING *ALL* INFORMATION REQUESTED.

HOTELS HOLDING ROOMS FOR A.P.H.A. AND RATES.

Map	*Hotel*	*Single*	*Double Rooms* *Double Bed*	*Twin Beds*
1	Alexander Hamilton *	$5.00–10.50	$ 6.00–10.00	$ 7.00–10.00
2	Bellevue *	5.00– 6.00	7.00– 8.00	7.00– 9.00
3	Beverly Plaza	4.50– 6.00	6.50– 8.00	6.50– 8.00
57	Biltmore	4.00–	5.00	6.00
4	Brayton	2.50– 3.00	3.00– 4.00	4.50– 5.00
6	Californian *	4.00– 5.80	6.00– 7.30	6.50– 8.30
7	Canterbury	4.00– 5.00	6.00	7.00– 8.00
8	Carlton	3.00– 3.50	5.00– 5.50	6.00
9	Cartwright	4.00– 5.00	6.00	7.00
10	Cecil	4.00– 5.00	5.00	6.50– 7.00
11	Chancellor	4.50–	6.00	7.00
12	Clift *	7.00–12.00	9.00–15.00	10.00–18.00
59	Commodore	4.00– 5.00	6.00– 7.50	7.00– 8.50
15	Crest	3.00– 4.50	4.00– 5.50	5.50– 6.50
16	Devonshire *	4.00–	5.00	6.00
16	Drake Wiltshire *	5.00– 6.00	6.00– 7.00	8.00– 9.00
17	El Cortez	3.50– 6.00	4.50– 7.00	6.00– 8.00
18	Embassy	3.50–	4.00	5.00
19	Fairmont *	8.00–13.00	11.00–16.00	11.00–16.00
20	Fielding	4.00– 6.00	5.00– 8.00	6.00– 8.00
21	Franciscan	2.50– 4.00	4.00– 5.00	5.50– 6.00
22	Golden State	3.00– 3.50	4.00– 5.00	6.00
23	Governor	3.00– 3.50	4.00– 5.00	6.00
60	Harcourt	3.00– 3.50	3.50– 4.00	5.00
24	Herbert	3.50– 4.00	4.00– 5.00	5.00– 6.00
25	King George	3.00– 4.00	4.00– 5.00	5.00– 6.00
61	Lafayette	4.00–	5.00	6.00
62	Lombard	4.00– 6.00	5.00– 8.00	6.00– 8.00
27	Manx *	3.50– 4.00	4.50– 5.00	6.50
28	Mark Hopkins *	8.00–11.00	11.00–15.00	11.00–15.00
31	Olympic *	3.50– 6.00	4.50– 6.00	6.00– 8.00
32	Oxford	3.00– 4.00	4.00– 6.00	6.00
33	Palace *	6.00–12.00	9.00–14.00	10.00–15.00
63	Palomar	3.50– 5.00	4.00– 6.00	4.50– 6.00
34	Pickwick *	3.50– 5.00	4.50– 6.00	5.50– 6.50
35	Plaza	5.00– 6.00	6.50– 8.50	7.00– 9.00
38	Roosevelt	3.00– 4.00	3.50– 5.00	6.00
39	St. Andrews	3.00–	3.50– 4.00	5.00
70	St. Francis *	6.00–14.00	8.00–14.00	10.00–18.00
42	Senate	3.00– 4.00	4.00– 5.00	5.00– 6.00
43	Senator	3.00– 3.25	3.50– 3.75	4.50– 5.00
44	Shaw	3.50– 4.00	4.50– 5.00	6.00– 6.50
45	Sheldon	3.00– 4.00	4.00– 5.50	5.50
46	Sir Francis Drake *	6.50–11.00	8.50–13.00	10.50–15.00
47	Spaulding	3.00– 4.00	4.00– 5.00	5.00– 6.00
48	Stewart	3.50– 5.00	5.00– 6.00	6.00– 9.00
49	Stratford	3.00– 4.00	3.50– 6.00	5.00– 6.00
50	Sutter *	3.00– 4.50	4.50– 7.00	6.00– 8.00
64	Travelers	3.50– 4.00	5.00– 5.50	6.00
52	Victoria	3.50– 4.00	4.50– 5.00	5.00– 6.00
53	Whitcomb *	4.50– 7.00	6.00–10.00	7.00–10.00
55	Y.M.C.A. Hotel	1.30 up		2.60 up
56	York	3.00– 4.00	3.50– 5.00	5.00– 6.00

* Parlor suites available. Rates on request.

Street Plan of San Francisco Showing Location of Housing Bureau Hotels



Hotel Reservation form is on page 1023. Please indicate your first, second, and third choice hotel. Single rooms are limited.

All reservations will be confirmed if requests are received not later than October 15.

ALL REQUESTS MUST BE ACCOMPANIED BY A DEPOSIT CHECK of $5 per person, or $10 per room, made PAYABLE TO THE A.P.H.A. HOUSING BUREAU. The deposit holds the room on your arrival day, regardless of the hour, and will be credited to your account. PLEASE DO NOT SEND U. S. POSTAL NOTES OR CASH.

Key

1 Alexander Hamilton
2 Bellevue
3 Beverly Plaza
57 Biltmore
4 Brayton
5 Cadillac
6 Californian
7 Canterbury
8 Carlton
9 Cartwright
58 Casa Nova
10 Cecil
11 Chancellor
12 Clift
59 Commodore
14 Court
15 Crest
16 Devonshire
16 Drake Wiltshire
17 El Cortez
18 Embassy
19 Fairmont
20 Fielding
21 Franciscan
22 Golden State
23 Governor
60 Harcourt
24 Herbert
28 Huntington
25 King George
61 Lafayette
26 Lankershim
62 Lombard
27 Manx
28 Mark Hopkins
30 New Dalt
31 Olympic
32 Oxford
33 Palace
63 Palomar
34 Pickwick
35 Plaza
36 Powell
37 Richelieu
38 Roosevelt
39 St. Andrews
70 St. Francis
41 San Carlos
42 Senate
43 Senator
44 Shaw
45 Sheldon
46 Sir Francis Drake
47 Spalding
48 Stewart
49 Stratford
50 Sutter
51 Terminal
64 Travelers
52 Victoria
53 Whitcomb
54 William Penn
55 Y.M.C.A. Hotel
56 York

ADVANCE REGISTRATION

FOR 79TH ANNUAL MEETING

AMERICAN PUBLIC HEALTH ASSOCIATION

SAN FRANCISCO, CALIF., OCTOBER 29–NOVEMBER 2, 1951

Members and Fellows of the American Public Health Association and other health workers who are not members who wish to register in advance for the San Francisco Annual Meeting are cordially invited to do so.

Each person should fill in the coupon below or a facsimile thereof and mail it with the registration fee to the Central Office. We will prepare for your attendance in advance and you can then pick up your program and badge without delay at a special section as soon as you arrive at Registration Headquarters in the Civic Auditorium. At that time your registration will have been recorded and it will only be necessary for you to supply your local hotel and room number to complete the registration procedure. If you know now at which hotel in San Francisco you will be staying, please add this information below.

Advance registrations cannot be accepted and recorded if received in Central Office after October 1, 1951.

Return to American Public Health Assn.,
1790 Broadway, New York 19, N. Y.

I wish to register in advance for the San Francisco Annual Meeting.

NAME .....

BUSINESS ADDRESS .....

CITY & STATE .....

TITLE OF POSITION .....

HOTEL IN SAN FRANCISCO .....

Non-member of A.P.H.A. Registration fee $4. ☐

Member of A.P.H.A. Registration fee $3. ☐

Fellow of A.P.H.A. Registration fee $3. ☐

Please send check or money order for amount shown

If you will be accompanied by your wife (or husband) or other dependent member of your family who is entitled to free registration, please list the name and address below:

NAME ..... RELATIONSHIP TO DELEGATE .....

STREET ADDRESS ..... CITY & STATE .....

THE ESP REPORTS

Forty-three health departments scattered from Connecticut to California and from the State of Washington to Texas are participating in time studies of environmental sanitation activities as a first step toward the development of an objective method for determining man power needs for environmental services. Studies have been in progress for more than 6 months and will continue throughout the present calendar year. The methods now in use were developed after field trials carried on for almost 2 years. The work has been financed by a 3 year grant from the National Institutes of Health and is part of the activities of the Engineering Section Project of the A.P.H.A.

Factual data on health department personnel and a completed Sanitation Evaluation Schedule are basic records furnished by each coöperating health department. In addition, the environmental sanitation personnel of each participating health department maintain detailed records of each action taken during the course of the study. The information recorded includes code designations for the specific activity, the type of premises involved, the program of which the work is part, and the time required. Travel time as well as time assigned to delays and otherwise not classified is a part of the basic record. All members of the divisions participate. The schedule calls for a complete recording of activities during each fourth week in 1951. The information collected is being transferred to machine record cards. Preliminary information concerning the health departments voluntarily contributing to the studies is available.

In the 43 health department jurisdictions reside more than 5¼ million people. These health departments are located in 22 states having a population of 94,000,000. There are 17 health departments in which most of the people live in towns of less than 2,500 population, while in 18 others the majority live in towns of 2,500 and over.

The health officer is a physician who also has an M.P.H. degree in 24 of the 43 health departments. A total of 369 sanitation workers are employed in the 43 health departments. About 32 per cent are college graduates, 7 per cent being engineers. Sixty-one per cent did not go beyond high school. About 7 per cent did not complete their high school education. There is approximately one sanitation worker to every 15,000 population, and nearly 200,000 people to each engineer. The average length of time of service of the health officer in the health department in which he is now serving is 60 months; the average for the person directly in charge of the sanitation activities is slightly more, being approximately 64 months.

The data for the first quarter are now being transferred to more than 50,000 punch cards for detailed statistical study and analysis.

Mr. L. M. Fisher, Engineering Field Associate, is directing the work. Counseling and assisting him is the Research Guidance Committee of the Engineering Section. Joel C. Beall is chairman. The other members of the committee are: Harry L. Case, John W. Fertig, Ph.D., Alfred L. Frechette, M.D., John M. Hepler, C.E., Ira V. Hiscock, Sc.D., Lewis B. Sims, and Clarence J. Velz, C.E.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Leiland W. Chapman, M.D., P.O. Box 194, Grove Hill, Ala., Health Officer, Clarke County Health Dept.

Joseph H. Denton, M.D., 37 Locust St., Falmouth, Mass., Health Officer, Falmouth Health Dept.

William J. Donald, M.D., M.P.H., Box 494, City Hall, Tuscaloosa, Ala., Health Officer, Tuscaloosa County Health Dept.

W. K. Fenton, M.D., 3800 Bloor St., West, Toronto 18, Ont., Canada, Medical Officer of Health, Township of Etobicoke

Thomas A. Gardner, M.D., 4146 Floral Ave., Norwood, Ohio, Student, School of Public Health, Univ. of North Carolina

Elizabeth Jolly, M.D., Box 208, Orinda, Calif., Student, School of Public Health, Univ. of California

Isaac Newton Jones, M.D., Greensboro, Ala., Health Officer

Richard C. Murphy, M.D., 8108 Balboa, Stockton, Calif., Medical Officer, San Joaquin Local Health Dept.

W. L. Orr, M.D., Ozark, Ala., Health Officer, Dale County Health Unit

Mary T. A. Poling, M.D., 104 Clinton Ave., Tiffin, Ohio, Health Commissioner, Seneca County Health Dept.

Josef Preizler, M.D., 1314 N. Flower St., Santa Ana, Calif., Student, School of Public Health, Univ. of California

Ernest R. Raphael, M.D., 80 Blvd. de Marseille, Casablanca, Morocco, Africa, Director of Health, American Joint Distribution Committee

Howard H. Schwindt, M.D., Main St., West Lafayette, Ohio, Health Commissioner, Coshocton County Health Dept.

Mary E. Seddon, M.B., 1095 N. Chester Ave., Pasadena 6, Calif., Student, School of Public Health, Univ. of California

Luis Torres-Aguiar, M.D., Box 10398, Caparra Heights, Puerto Rico, Physician-in-charge, Infant's Hygiene Clinics, San Juan, Puerto Rico

Laboratory Section

Georgene Blauer, 201 St. Claire Bldg., San Jose, Calif., Technologist, San Jose Clinical Laboratories

W. A. Collier, M.D., Medical School, Paramaribo, Suriname, Dutch Guiana, S.A., Chief, Government Bacteriology Laboratory

Coral Beth DePenning, 3332 N. E. 14th, Portland 12, Ore., Senior Bacteriologist, Hygienic Laboratory, State Board of Health

Alfred G. Dixon, 1284 Soldiers Field Rd., Boston 35, Mass., Vice-President, International Equipment Co.

Samuel W. Freed, M.S.P.H., 403 W. Radiance Drive, Greensboro, N. C., Student, School of Public Health, Univ. of North Carolina

Thomas G. Grubb, Ph.D., 60 West St., Bloomfield, N. J., Prince Matchabelli, Inc., Division of Pharmacy Research

Willa Dean Lowery, 1668 Osceola St., Jacksonville, Fla., Bacteriologist, State Board of Health

John M. McKenna, 9 Convent St., Providence 8, R. I., Student, Providence College

Masayuki Okino, Rt. 1, Box 235, Parlier, Calif., Student, Univ. of California, Berkeley

Dale J. Richey, M.S., Box 265, State College, Miss., Asst. Professor, Dept. of Bacteriology

Carl N. Shadix, 1014 Broadway, Cincinnati 2, Ohio, Chemist, Federal Security Agency, U.S.P.H.S.

Statistics Section

Donald G. Hay, Ph.D., 156 Cascadilla Park, Ithaca, N. Y., Social Science Analyst, U. S. Dept. of Agriculture

H. Gene Miller, M.A., 425 N. Michigan Ave., Chicago 11, Ill., Director, Statistical Division, National Safety Council

Engineering Section

Homer K. Ball, Athens, W. Va., Sanitation Supervisor, State Dept. of Health

Frank W. Chesrow, 35 W. Jackson Blvd., Chicago 4, Ill., Trustee, Sanitary District of Chicago

John M. Costopoulos, M.S., 32 Maizonos St., Athens, Greece, Director, Section of Insect Control, Ministry of Health

Kazuyoshi Kawata, M.S., United Christian Schools, Jullundur, Punjab, India, Sanitary Engineer, Board of Missions, Methodist Church

K. S. Krishnaswamy, 177 5th Road, Chamarajapet, Bangalore, Mysore State, India, Sanitary Engineer, Mysore State Government, India

Ross L. Mecham, 525 Lester Lane, Winston-Salem, N. C., Senior Sanitarian, Winston-Salem, Forsyth County Health Dept.

Albert A. Porti, 2047 S.W. 10th, Portland 1, Ore., Sanitarian, Multnomah County Health Dept.

Walter H. Sheffield, 4785 Long Island Drive,

N.E., Atlanta, Ga., Asst. Engineer, Fulton County Health Dept.

Captain Ralph J. Walsh, M.S.C., Hq. 9th Hospital Center, Brooke AMC, Fort Sam Houston, Tex., Sanitary Engineer, U. S. Army Medical Service Corps

Industrial Hygiene Section

Bernard Beaupre, M.A., M.S., City Hall, Room 407, Montreal, Canada, Smoke Control Engineer, City of Montreal

Emmanuel T. Gatchalian, M.D., M.P.H., 43 Buencamino St., Aulles, Manila, Philippines, Student, Univ. of Pittsburgh

Jack Smolensky, M.S., 8 Main St., Binghamton, N. Y., Teacher of Chemistry, Binghamton Central High

Ismail Ali Topuzoglu, M.D., M.P.H., Salkim Sogut Sokak 15 kat I, Istanbul, Turkey, Asst. Physician, North Reading State Sanatorium, North Wilmington, Mass.

Food and Nutrition Section

Lt. Col. Joseph H. Berger (VC), 55 Shattuck St., Boston 15, Mass., Veterinarian, Medical Dept., U. S. Air Force

Donald P. Conwell, M.D., M.A., 1649 8th Ave., West, Birmingham, Ala., Director, Mission Hospital, Wema, Belgian Congo, United Christian Missionary Society

Dorothy Doty, 7301 W. 32nd, Wheat Ridge, Colo., Student, Univ. of Michigan

J. Aileen Merwin, M.S., 695 Huntington Ave., Boston 15, Mass., Research Fellow, Dept. of Nutrition, Harvard University School of Public Health

Lt. Ann E. Shea, W.M.S.C., Murphy Army Hospital, Waltham, Mass., Hospital Dietitian, U. S. Army

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Maternal and Child Health Section

Consorcia G. Bautista, M.D., M.P.H., 23 Mariveles St., Quezon City, Philippines, Maternity and Charity Physician, Bureau of Hospitals, Dept. of Health, Manila, Philippines

Martin Harwin, M.D., 65 Lenox Road, Brooklyn, N. Y., Physician

Samuel Untracht, M.D., 50 E. 78th St., New York 21, N. Y., Pediatric Consultant, Division of Maternity and Newborn Services, New York City Dept. of Health

Public Health Education Section

Mary Allen Cowgill, M.A., 17 Ford Ave., Oneonta, N. Y., Exec. Secy., Otsego County Tuberculosis and Public Health Assn., Inc.

Walter S. R. Dickinson, Jr., 426 Broadway, Saratoga Springs, N. Y., Exec. Secy., Saratoga County Tuberculosis and Public Health Assn.

Chatham H. Forbes, A.M., 618 Fourth St., Santa Rosa, Calif., Exec. Secy., Sonoma County Tuberculosis and Health Assn.

Ernest M. Frost, Ed.D., M.A., 11 North Pearl, Albany, N. Y., State Representative, National Foundation for Infantile Paralysis

John H. Graham, 2737 N.W. Upshur St., Portland 10, Ore., Sanitarian, Multnomah County Health Dept.

Helen C. Joseph, M.P.H., Box 577, Charlotte Amalie, Virgin Islands, Health Educator, Virgin Islands Dept. of Health

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Nellie R. Lomprey, 4 Ashbury Terrace, San Francisco, Calif., Health Education Field Training, Multnomah County Health Dept., Oregon

Anna Skiff, 216 Kingsland Terrace, South Orange, N. J., Student, Columbia Univ. School of Public Health

Leda H. Smith, 87 East Broadway, Room 217, Eugene, Ore., Exec. Secy., Lane County Tuberculosis and Health Assn.

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Maria Zalduondo, M.S.P.H., Bureau of Health Education, Dept. of Health, Santurce, Puerto Rico, Acting Chief, Health Education Bureau

Public Health Nursing Section

Maude C. Bailey, M.A., State Board of Health, Columbia 1, S. C., Asst. Director, Public Health Nursing, Div. of Local Health Services

Bertha L. Bloomer, Box 191, Alaska Dept. of Health, Juneau, Alaska, Maternity and Child Health Nursing Consultant

Ruth H. M. Granger, R.N., Public Health Nurse, Washburn County, Shell Lake, Wis.

Martha E. Keaton, 2805 Columbus, Muskogee, Okla., Area Consultant in Hospital Nursing, U. S. Indian Bureau

Marie Lehti, 1826 Haldane, Cleveland, Ohio, Educational Director, Cleveland Visiting Nurse Assn.

Edna S. Miller, 2427 Main St., Stratford, Conn., Supervisor, Stratford Visiting Nurse Assn., Inc.

Mary Randel, Carl Mackley, Apt. 251, "M" & Bristol, Philadelphia 24, Pa., Supervisor, Visiting Nurse Society of Philadelphia

Gladys M. Ray, M.P.H., 3541 Ocean Front, San Diego 8, Calif., Tuberculosis Nurse Consultant, U.S.P.H.S.

Imogene Smith, State Dept. of Health, Austin, Tex., Consultant, Orthopedic Nursing

Miriam Taietz, 221 Ridgedale Road, Ithaca, N. Y.

Epidemiology Section

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Earl W. Reber, M.D., M.P.H., Lutheran Mission in Liberia, Monrovia, Rep. of Liberia, Africa, Medical Missionary, Chairman Medical Committee

School Health Section

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Toyo Shimizu, D.D.S., Fort Defiance, Ariz., Dental Supervisor, Bureau of Indian Affairs, U.S.P.H.S.

Medical Care Section

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F. J. H. Campbell, M.D., 541 Dundas St., London, Ont., Canada, Chairman, Board of Health, London, Ontario, Canada

William H. Childress, Jr., Tennessee Valley Authority, Div. of Health & Safety, Chattanooga, Tenn., Administrative Analyst

Harold F. Eisele, Ph.D., 7500 Gloster Road, Washington 16, D. C., Chief, Plans and Reports Branch, Division of Administrative Management, Bureau of State Services, Public Health Service

Junius W. McClellan, M.D., 523 Hunter Blvd., Lansing, Mich., Resident in Occupational Medicine, Saginaw General Hospital

Harold Gill Reuschlein, J.S.D., 194 Park Ridge Lane, Pittsburgh 28, Pa., Professor of Law and Director, Public Health Law Research Project, Univ. of Pittsburgh

William B. Schaffrath, Ph.D., The Johns Hopkins Hospital, Personnel Dept., Baltimore 5, Md., Director of Personnel Relations

A.P.H.A. membership application blank on page XXVII

EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

POSITIONS AVAILABLE

Deputy Health Commissioner with special training and experience in tuberculosis control and public health administration. Appointment made under Civil Service. Salary range $7,669–$8,514. Write: Dr. J. Earl Smith, Commissioner of Health, St. Louis 3, Mo.

Medical Health Officer for Shelby-Effingham County Health Department. Salary range $6,900–$9,000. May start above minimum. Must have capacity for good relations. Write: Mr. J. H. Griffin Teutopolis, Ill., or Dr. O. G. Kauder, Findlay, Ill.

Medical Health Officer for local health work in the State of Washington. No experience required. Salary range $6,480–$7,764. Write: J. A. Kahl, M.D., State Director of Health, 1412 Smith Tower, Seattle, Wash.

Health Officer for Gary, Ind. Salary range $9,000–$9,500. Well developed program, good staff, separate health center building. For further information, write: L. E. Burney, M.D., State Health Commissioner, Indianapolis 7, Ind.

Director, City-County Department of Health. Salary range $10,000–$12,000. Applicant must have degree of public health from recognized school and at least 2 years experience in local health administration. For further information, write: Dr. Lawrence W. Daves, Department of Health, 201 S.E. Third Street, Evansville, Ind.

Public Health Physician as Medical Director of Bi-County Health Department in Southwestern Illinois. Important public health job to be done. Salary $7,000. Apply: Dr. Emmett J. Gillespie, Secretary, Alexander-Pulaski Bi-County Board of Health, Cairo, Ill.

Health Officer—Grade I for the City of Poughkeepsie. Starting salary $8,000. Write: Edith G. Mead, M.D., Board of Health, Poughkeepsie, N. Y.

Physician II (Public Health Option). San Diego Department of Civil Service and Personnel has extended until further notice the examination for this position. Salary range $647–$713 per month. For application forms and complete information write: Room 402, Civic Center, San Diego, Calif.

Sanitarians for Foreign Employment. Major oil company with extensive operations in the Middle East requires qualified sanitarians for immediate and future openings in the medical department. College training, with 3 years public health and sanitation experience required. Write, giving full particulars regarding personal history and work experience to: **Box A–98,** Employment Service, A.P.H.A.

Sanitary Engineer or Sanitarian for Sanitation District in City-County Department; program generalized. Beginning salary from $3,300–$4,000, depending on qualifications and experience. For details, write: John H. Pomeroy, Public Health Engineer, City-County Health Department, City Hall, Kalamazoo, Mich.

Sanitarian—college graduate with some experience preferred; good salary and working conditions. Write: Director, McLean County Health Department, 1009 N. Park Street, Bloomington, Ill.

Women Physical Therapist with car to work with State Crippled Children's Service. Must be graduate of approved school with at least one year's experience. Above average salary scale, travel allowance, sick leave, vacation, retirement. Write: J. E. Waddill, Personnel Officer, State Department of Public Health, Box 640, Boise, Idaho.

Physical Therapists with experience; preference given to nursing background. Agency program offers service under medical prescription to patients in their homes; includes care of early sub-acute poliomyelitis patients; and provides supervised experience opportunity for physical therapy students. Salary dependent on education and experience. Five day week, liberal holiday, vacation and sick leave allowance. Near two approved schools of physical therapy; university facilities available locally for educational plans. Immediate placement. Write: Ruth E. Te-

Linde, Executive Director Visiting Nurse Association, 1038 N. Cass Street, Milwaukee, Wis.

Public Health Nurses. Generalized program, salary and working conditions excellent. Write: Director, McLean County Health Department, 1009 N. Park Street, Bloomington, Ill.

Qualified Supervising Public Health Nurse for District Health Department. Salary $3,480 to start; Merit System status. For additional information, write: J. E. Waddill, Personnel Officer, P.O. Box 640, Boise, Idaho.

Tuberculosis Nursing Supervisor—generalized service including progressive school program; 50 field nurses. One month's vacation, 5 day 35½ hour week, sick leave, retirement plan. For use of personal car, allowance of 7¢ per mile. Degree, special preparation in tuberculosis nursing required. Beginning salary $4,000.

Public Health Nurses—qualified, salary $3,000 to $3,300.

Junior Nurse—salary $2,600–$2,800.

Trainee—salary $2,500.

For information on above positions, write: Dr. William H. F. Warthen, Health Officer, Baltimore County Health Department, Towson 4, Md.

Public Health Nurses. Salary $256–$327 per month; special bonus for Desert Area. Public Health Nursing Certificate required; must have car. Write: County Civil Service Office, 236 Third Street, San Bernardino, Calif.

Public Health Nurse for generalized county program; urban and rural work. Five day week, 3 weeks' vacation, 3 weeks' sick leave if necessary; retirement system; 7½¢ per mile. Ideal climate. Starting salary $290 per month. Write: D. D. Carr, M.D., Clark County Health Department, Las Vegas, Nev.

Nurse Director for combination agency in New York City area. Generalized service, including school health program, graduate student affiliation, 16 field nurses, and 2 supervisors. Excellent personnel policies and working relationships. Preparation and experience to meet N.O.P.H.N. standards required. State qualifications, date available, and salary minimum. Write: John A. Darsie, President, V.N.A. of Plainfield and North Plainfield, 703 Watchung Avenue, Plainfield, N. J.

Immediate opening for **Executive Secretary** of a voluntary health organization in a midwestern state. Assume full administrative responsibility for staff of 55 people and for state-wide program. Medical degree not required. Must have had proven administrative experience. Salary exceptionally attractive for top health administrator of superior caliber. Write: **Box A-99,** Employment Service, A.P.H.A.

The Tacoma-Pierce County Health Department has openings for **Physicians** as follows: (a) a doctor to perform the duties of the Assistant Director of Health, and (b) a doctor to perform screening in the Medical Care program. Write: Dr. C. R. Fargher, Director of Health, Tacoma 2, Wash.

Director of Nurses—Demonstration Health Center, voluntary agency (population 100,000; nursing staff expected to be about 20 to 30) in large Eastern city. Combination nursing service now being planned. Salary dependent upon qualifications. Experience in supervision and bachelor's degree required; M.P.H. or Master's desirable. One month vacation; 5 day week; sick leave; good retirement plan. Write: **Box Mi-4,** Employment Service, A.P.H.A.

POSITIONS WANTED

Health Educator—A.B., M.P.H., male, age 29. Four years' successful public health experience in development of local health education program. Experience includes community organization, school health, coöperative interagency projects, production of materials, adult group work, use of mass media, and college teaching. Interested in position with official or voluntary agency, or teaching. Write: **Box H.E.–34,** Employment Service, A.P.H.A.

Health Educator—M.S., M.P.H., L.T., H.S.D., male, age 31. Background in public health and school health education programs. Native of India, trained in the United States; held responsible positions State Education De-

partment, India. Interested in college teaching or health education with official or voluntary agencies any part of the world. Write: **Box H.E.–35,** Employment Service, A.P.H.A.

Health Educator—M.S. in Public Health Education September, 1951. Female. Major experience background in diagnostic medical bacteriology and library work. College training in speech, dramatics, play and radio production work. Now eligible for a responsible, challenging position in a voluntary or an official agency with a public health education program. Special interest is mental hygiene. Available about October 1. Write: **Box H.E.–36,** Employment Service, A.P.H.A.

Bacteriologist—Ph.D., Male. Dairy manufacturing, biochemistry background; 2 years' industrial and research experience. Write: **Box L.–19,** Employment Service, A.P.H.A.

Bacteriologist—Ph.D., M.P.H. Eight years' experience as Public Health Laboratory Director; 8 years experience in teaching in medical school. Interested in responsible position in public health laboratory, teaching, or sanitation. Write: **Box L.–18,** Employment Service, A.P.H.A.

Nutritionist—M.S. in nutrition; 3½ years experience with U.S. Public Health Service and 7 years experience as nutritionist with state health department; 2 years as Home Management Supervisor with Farm Security Administration; 5 years as hospital dietitian. Write: **Box N.–3,** Employment Service, A.P.H.A.

Administrative Assistant—B.A., M.P.A. Two years law; 10 years administrative and business management experience in child health, school health, district health administration, environmental sanitation, records and statistics, with N.Y.C. Department of Health. Challenging position with opportunities desired. Write: **Box C.–20,** Employment Service, A.P.H.A.

ANNOUNCEMENTS

Fellowships for Women, 1952–1953

Twenty-five fellowships are offered by the American Association of University Women to American women for advanced study or research during the academic year 1952–1953.

In general, the $1,500 fellowships are awarded to young women who have completed two years of residence work for the Ph.D. degree or who have already received the degree; the $2,000–$2,200 awards to more advanced students or those who may need to study abroad; the $3,000 awards to more mature scholars who need a year of uninterrupted work for writing and research. Unless otherwise specified, the fellowships are unrestricted as to subject and place of study.

Applications and supporting materials must reach the office in Washington by December 15, 1951. For detailed information concerning these fellowships and instructions for applying, address the Secretary, Committee on Fellowship Awards, American Association of University Women, 1634 Eye Street, N.W., Washington 6, D. C.

U. S. Public Health Service Announces Regular Corps Examination for Dental Officers

Competitive examinations for the appointment of Dental Officers to the Regular Commissioned Corps of the U. S. Public Health Service will be held September 25, 26, and 27 in various cities throughout the country. The examination will include professional written tests, a practical demonstration, an oral interview, and a physical examination. Completed applications must be in the Washington office by August 25, 1951.

Appointments are permanent and provide opportunities for career service in clinical, public health, and research dentistry. Appointments will be made in the grades of Assistant and Senior Assistant, equivalent to Navy ranks of Lieutenant (j.g.) and Lieutenant, respectively. Entrance pay is $5,686.56 for Assistant Dental Surgeons with dependents, and $6,546 for Senior Assistants, including rental and subsistence allowance. Applicants must expect to receive professional degree no later than June, 1952, and by that time must have completed a total of seven years of training and professional experience subsequent to high school. All applicants must be citizens of the United States.

For application forms and additional information write to: Surgeon General, U. S. Public Health Service, Federal Security Agency, Washington 25, D. C., Attention: Division of Commissioned Officers.

Higher Salaries for New York State Physicians

In recent months all physicians in the New York State Department of Health have had the annual salary of their positions raised in amounts varying from $1,000 to $1,900. A number of positions are open for Health Officer and for consultants in tuberculosis, maternal and child health, communicable diseases, medical rehabilitation, and pathology.

Most of the consultant jobs start at $8,594 and with three annual increases reach $9,610. The combination of public health and clinical training or experience is required for the specialized jobs in obstetrics, pediatrics, rheumatic fever, venereal diseases, and tuberculosis. For physicians with a minimum of preparation in these fields or in the specialty of public health, there are a variety of openings at $6,991 with three annual increases to $7,804. Permanent tenure can be attained without written examination and for some positions citizenship is waived.

In addition to the salary advances, other career benefits in New York State include excellent promotion opportunities and job interest through expanding programs and association with recognized leaders. Among other advantages are four weeks vacation, and a superior retirement system which now promises retirement at 55 years of age. The department also offers liberal stipends and tuition for academic training in public health.

For further particulars, write to R. H. Mattox, Personnel Director, State Department of Health, Albany, N. Y., or to State Department of Civil Service, Albany, N. Y.

Advertisement

All communications should be sent to Burneice Larson, Medical Bureau, Palmolive Building, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE FOR THE FOLLOWING—(a) PUBLIC HEALTH PHYSICIAN to direct city-county health department; excellent staff; program well supported; college town, 40,000; Midwest. (b) SUPERVISOR, public health nursing services; SENIOR PUBLIC HEALTH NURSES; MATERNAL AND CHILD HEALTH CONSULTANT; and STAFF NURSES; state health department having expansion program; West. (c) HEALTH EDUCATOR; town of 35,000; Pacific Northwest. (d) PUBLIC HEALTH DENTIST; county and local health departments; Midwest. (e) SANITARIANS; Asia; $7,000. (f) CHIEF MEDICAL OFFICER; South America. (g) HEALTH EDUCATOR to direct community prevention of blindness program; Midwest metropolis. (h) CHIEF NURSE; health department, public schools; staff of eight field nurses; Chicago area. (i) PHYSICIAN to direct industrial hygiene; state department; East; $10,000. (j) PUBLIC HEALTH NURSE to direct rehabilitation programs, large company; openings, New York, Midwest, South, Southwest. (k) NUTRITION CONSULTANT; Chicago area.

Please direct all inquiries to BURNEICE LARSON, THE MEDICAL BUREAU, PALMOLIVE BUILDING, CHICAGO.

WANTED—OPPORTUNITIES FOR THE FOLLOWING—(a) PUBLIC HEALTH PHYSICIAN; six years' general practice; M.P.H., Johns Hopkins; eight years' experience, public health administration. (b) PUBLIC HEALTH DENTIST; Ph.D. (Public Health and Social Welfare); eight years' successful private practice; two years' public health experience. (c) INDUSTRIAL HYGIENIST; M.S. Harvard; five years, hygienist, U.S.P.H.S.; eight years, chief, state department, industrial hygiene and assistant professor of public health, university medical school. (d) PUBLIC HEALTH NURSE ADMINISTRATOR; B.S. (Public Health Nursing), M.A. (Health Education); four years' teaching experience (Public Health Nursing); five years' executive experience, metropolitan health department. (e) HEALTH EDUCATOR; M.S., D.P.H., eastern universities; five years, associate professor hygiene and public health; four years, director health education, state health department. Please direct all inquiries to BURNEICE LARSON, THE MEDICAL BUREAU, PALMOLIVE BUILDING, CHICAGO.

NEWS FROM THE FIELD

WHO NEWS

Meeting of WHO Executive Board

The eighth meeting of WHO's Executive Board ended in Geneva on June 10 after a 10 day session, immediately following the Fourth World Health Assembly. It agreed to hold its ninth session at Geneva beginning January 25, 1952.

Jacques Parisot of France, professor of hygiene and social medicine, president of the Directing Council of the French National Health School, and former chairman of the Health Committee of the League of Nations, was elected chairman of the Board, which is made up of one representative from each of 18 member countries. H. van Zile Hyde, M.D., is the United States representative.

African Regional Office

Among actions taken by the Board was the authorization, following an agreement by member states in that region, of an African regional office to serve countries south of the Sahara. The location has not yet been decided. A first meeting of the Regional Committee for Africa will be held in September, when a program will be developed on the basis of the reactions of the interested governments to the tentative plans made by the Executive Board in June. Dr. Frederick Cluver of the Union of South Africa is chairman of the Regional Committee for Africa.

Emergency Relief In Stricken Areas

Emergency action was taken to help prevent epidemics in the famine-stricken areas of India, and $30,000 was appropriated for medical supplies to prevent outbreaks of cholera and malaria in North Bihar.

The level of expenditures for 1951 was raised by nearly $350,000 in order to provide relief for the civilian population of Korea and for Turkish refugees in Bulgaria.

Greater Coöperation with ILO

In authorizing the widening of coöperation between WHO and the International Labour Office, the Executive Board approved a joint committee of experts to prepare a basis for coöperation in the fields of health and social insurance.

New Sanitary Regulations

The Board asked that work be started on four new international health regulations with respect to:

a. Control of malaria insect vectors in international traffic.
b. Sanitation standards at airports.
c. International Pharmacopoeia.
d. Legal protection of international nonproprietary names of drugs.

Population Problems

The Board also asked that WHO continue its study of population problems, with particular reference to the health aspects of such problems. This study should include measures for the control of population increases.

Establishes Aftosa Center in Brazil

A Pan American Center for the control of foot and mouth disease is being set up in Brazil by the Pan American Sanitary Bureau, Regional Office of WHO. It will be the first center in the Americas devoted to work on an animal disease on a continent-wide scale. Here will be provided one conveniently located international center capable of carrying out diagnosis of aftosa wherever it may arise in the Americas. Accurate diagnosis is considered the keystone in the control of the disease. The Center will

also serve to train workers in diagnostic and research methods.

The project grew out of a proposal made by Dr. Alberto Lleras, secretary general of the Organization of American States, which is financing the project with Technical Assistance funds, $225,000 having been allocated to the Bureau for the first year's operations. This will pay for specialized equipment and 13 professional, technical, and administrative staff members. Plans for the operation of the program on a 5 year basis were drawn up by Dr. Benjamin D. Blood, chief of the Bureau's Veterinary Public Health Section. The host government, Brazil, has agreed to furnish the land, structures, local labor and services, and utilities.

Sao Bento, about 15 miles from Rio de Janeiro, has been selected as headquarters. Laboratories already in the area are being assigned to the Center, adjoining which the additional buildings are to be erected by the Brazilian Government.

Dr. Ervin A. Eichhorn, formerly of the Pathological Division, Bureau of Animal Industry of the U. S. Department of Agriculture, has been appointed director of the Aftosa Center.

Rome Microbiology Research Centre

The International Research Centre for Chemical Microbiology, which is recognized by WHO as an international center, was opened in Rome on June 25. It will provide international research and training facilities in antibiotics, thus meeting the need of many countries that lack facilities for basic research on antibiotics, particularly with regard to problems of production. Its laboratories contain large-scale pilot plant facilities for substantial production of substances of microbiological origin and biochemical interest for research purposes.

The Centre, directed by Professor E. B. Chain, F.R.S., is attached to the Istituto Superiore di Sanità, the chief center for medical research and drug control of the Italian Government. Director of the Istituto is Professor Domencico Marotta.

As a part of the opening ceremonies a symposium on "Bacterial Growth and its Inhibition" was held in which some 20 scientists currently engaged in antibiotics research took part. Among these was Dr. Selman A. Waksman of the Rutgers Institute of Microbiology, discoverer of streptomycin and Lasker Award winner in 1948. Dr. Brock Chisholm, WHO director, and Professor Chain made the opening addresses. This symposium was sponsored jointly by the Istituto Superiore di Sanità, the Council for the Co-ordination of International Congresses of Medical Sciences, and WHO.

Reports on BCG Vaccination

The first two reports of a series of studies on BCG vaccination from the Tuberculosis Research Office of WHO at Copenhagen have appeared. By Lydia B. Edwards, M.D., chief of field studies, and Anna S. Gelting, statistician, these studies were carried out under the guidance of Carroll E. Palmer, M.D., of the U. S. Public Health Service's Division of Chronic Disease and Tuberculosis, and J. H. Holm, M.D. The titles are:

1. Effect of Age of Vaccine and Variation in Storage Temperature and Dosage on Allergy Production and Vaccination Ten Weeks after Vaccination.
2. Effect of Variation in Dosage of BCG Vaccine on Allergy Production and Vaccination Lesions Nine Weeks after Vaccination.

This series of studies was started as a joint undertaking of WHO's Tuberculosis Research Office, the Danish Statens Seruminstitut, and the Joint Enterprise, which is the name given to the mass BCG vaccination program carried out jointly by UNICEF, Norwegian Relief for Europe, and the Danish and Swedish Red Cross. These two reports appeared

in the first two issues of volume 3, 1950, of the Bulletin of WHO. They are now available in reprint form.

PRINCIPLES RELATING TO STATE AND LOCAL COMMUNITY PLANNING FOR HEALTH WITH PARTICULAR REFERENCE TO HEALTH COUNCILS

The following statement has been officially adopted by the six national associations constituting the Inter-Association Committee on Health, namely,

The American Dental Association
The American Hospital Association
The American Medical Association
The American Nurses' Association
The American Public Health Association
The American Public Welfare Association

Reginald M. Atwater, M.D., secretary of the Inter-Association Committee on Health, has released the statement for publication:

Although the origins of democratic bodies concerned with community planning for health cannot be clearly identified, the current trend on local, state, and national levels toward coöperative stimulation, planning, and coördination of all health effort on a community-wide basis began to take form in the decade marked by the First World War. Today, while the number of such community health planning bodies operating in various parts of the country is not accurately known, it is estimated to approach 1,000. These bodies whether they be called "health committees," "health federations," "health divisions of councils of social agencies," "citizen planning committees," or simply "community health councils," have demonstrated, during the last quarter century, that they are essential instruments for the democratic achievement of improved community health. Today, old councils are being revived and reorganized and new ones are being formed at an ever accelerated rate. They do not need pressure from above but guidance, encouragement, and assistance from all sources so that they may better meet the needs and conditions within their own communities.

As a means of furthering this community effort, the Inter-Association Committee on Health of the six national associations of professional health and welfare workers adopts the following principles relating to "State and Local Community Planning for Health."

I. Basic Premises Underlying Planning for Health

1. Health may be defined as a state of optimal physical, mental and social well-being—not merely the absence of disease or infirmity.
2. Health is a function of the individual's, the family's and the community's total way of life.
3. The initiative and interest of the individual in his own health is essential to the effective furtherance of the health of the community. The effective furtherance of community health is also dependent upon the initiative, interest, aggressive support and participation of the entire community —professional workers and laymen, individuals and groups.
4. The maintenance and promotion of the health of all members of a community cannot be an isolated activity; planning for health is a part of—and should be integrated with—planning for economic and social well-being. Independent, uncoördinated, planning in such fields as family life, rural life, education, recreation, delinquency, housing, welfare, medical care, and especially in the fields of specific diseases and other special health problems has led to, and perpetuates, an unrealistic separation of services.
5. The most effective instrument for implementing community planning for health is the "health council"—
   A voluntary association of individuals and organizations, representative of the entire community, which concerns itself with the joint evaluation of health needs and the planning and coördination of health services so as to bring about more effective utilization of health resources.

II. Basic Principles of Organization and Operation of Health Councils

1. Successful health councils evolve through a process of group thinking, stimulated by effective leadership. They can be and many are initiated as a result of the stimulus of higher level recommendations. Many are first formed under the leader-

ship of local members of the medical, health and welfare professions. But only when widely inclusive representatives of the area's lay and professional people have gone through the process of learning that they can work together creatively for the public good and have decided that the work requires a permanent organization, can the most effective health council result.

2. The establishment of a health council need not await the creation of a more comprehensive community planning body. In fact, when an effective health council comes first, it may eventually serve as a springboard for the development of a broader citizens' council.
3. A health council should be truly representative of the community's health interests and should allow for expansion and for affiliation with a more comprehensive council when and if such affiliation is feasible.
4. The boundaries of a community, for health planning, need not coincide with state or county lines or with the corporate limits of a city or town. The planning body may effectively represent any "natural community," rural or urban.
5. Health councils should conform to the needs, desires, attitudes, and population make-up of the individual community—they cannot successfully be imposed from above.
6. Community health promotion requires teamwork among many groups. The key groups are: physicians in private practice and in public health, dentists, nurses, and others working in the health field. In addition, the team requires representatives of voluntary health agencies, other professional groups, organizations concerned with fields related to health, as well as other lay groups and individuals that have an interest in community health services.
7. Responsibility, leadership, and participation need to be widely spread in order that the council may effectively draw on the talents and knowledge of its many participants, and bring about their active involvement.
8. A health council operates more effectively when it can demand the continuous services of a specially qualified person who is not identified with any one agency or group and who can remain in a position to work objectively with all groups.
9. Plans for action should not be made without obtaining correct facts and competent professional guidance; they have to be based on demonstrated needs.
10. Successful state and local councils require continuous financial support. It is best for them to be financed by contributions from within their own community, and from sources which will not tend to limit their freedom of thought and action.

III. Local, State, and National Relationships

No definite patterns have yet been determined for the necessary relationships between local and state health councils and the National Health Council. These relationships are currently under study and recommendations will shortly be forthcoming. In the meantime there should be:

1. Complete willingness of each level to coöperate with and assist the others; and
2. The maintenance of clear channels of communication between levels.

IV. Major Recommendations for Promoting Community Health Planning

1. Sponsor regional, state, or local meetings with broadly inclusive lay and professional representation, to encourage:
   (a) the early formation of local and state health councils, where they do not now exist;
   (b) the strengthening of existing local and state health councils as more effective instruments for community health planning; and
   (c) the affiliation of each health council with a broader community planning body, where feasible.
2. Promote the development and maintenance of full-time official public health departments, and other essential health services, which are basic to community health.
3. Stimulate the recruitment, and both preservice and inservice training, of qualified professional personnel to serve in health agencies, both official and voluntary, and in health councils.
4. Encourage citizens, both as individuals and as representatives of lay organizations, to participate in community planning for health in order that they may assume their proper role of leadership in meeting their own health needs.

SHATTUCK AWARD TO DR. CHADWICK

The second annual Shattuck Award of the Massachusetts Public Health Association was presented to Henry Dexter Chadwick, M.D., at its meeting in Boston on April 16. Dr. Chadwick has devoted his entire professional career, except for four years, to New England, where he instituted the celebrated "Ten-

Year Program for the Early Detection of Tuberculosis in Children." National tuberculosis authorities have assessed this undertaking as one of the outstanding contributions to the world-wide campaign against the disease.

Prior to 1924 it had been the general practice to examine only underweight children for evidences of tuberculosis, on the theory that they alone were susceptible. As administrator of the Westfield State Sanatorium in Massachusetts, Dr. Chadwick made some careful studies both of underweight and normal and overweight groups. He found both the infection rate and the active rate about equal in each group. Following this, the Ten-Year Program, later known as the "Chadwick Clinics," was set up for the examination of all school children.

Dr. Chadwick's four years away from New England were as health commissioner of Detroit. He has also been Massachusetts Commissioner of Health and president of the National Tuberculosis Association. He is a Fellow of the American Public Health Association.

BIOLOGICAL STAIN COMMISSION MEETS

The Biological Stain Commission at its annual meeting at the University of Pennsylvania authorized its research committee to make research grants aggregating some $10,000 to institutions and individuals to study and improve stains and staining technics.

The Commission was organized in 1921 as a committee of the Division of Biology and Argiculture of the National Research Council, became a separate body in 1922, and took its present name in 1944. It has a regular membership by invitation of about 50, and 9 delegate members appointed by other scientific organizations, as well as 7 foreign members-by-invitation. Edmund K. Kline, Dr. P.H., is the appointed delegate of the A.P.H.A.

H. J. Conn, director of the Commission's laboratory in Geneva, N. Y., has been its president continuously since 1922. At the recent meeting he was elected secretary. Other officers are:

President: H. A. Davenport, M.D., Northwestern University Medical School
Vice-President and Recording Secretary: S. I. Kornhauser
Treasurer: H. E. Stotz, director of the Commission's Rochester, N. Y., laboratory

DR. ELIOT NEW CHILDREN'S BUREAU CHIEF

Miss Katherine F. Lenroot, who has been in the U. S. Children's Bureau for nearly 37 years, the last 17 as its chief, has retired from the Bureau, effective August 31. President Truman has appointed Martha M. Eliot, M.D., as the new chief of the Bureau. Before her last two years as assistant director general of the World Health Organization, Dr. Eliot was associate chief of the Children's Bureau, which she had served continuously since 1924.

Dr. Eliot, as head of the health and medical services of the Bureau, supervised the operations of the Emergency Maternity and Infant Care program of the last World War. For "administrative organization and operation" of EMIC she received in 1948 the Lasker Award of the American Public Health Association, of which she is a Fellow and which in the same year she served as its first woman president.

In WHO, Dr. Eliot, in charge of advisory services, pioneered in developing the organization of public health services in countries asking WHO's assistance. She was particularly interested in the cooperative relationships between WHO and UNICEF.

Miss Lenroot has represented the United States on many international bodies dealing with the welfare of children. She was secretary of the Temporary Social Commission of the United Nations in 1946. She was president of the National Conference of Social Work in 1935 and recipient of the Survey Award in 1950. She is a member of the

American Public Health Association and of the board of directors of the National Health Council. Upon her retirement, she will live in Hartsdale, Westchester County, New York.

CONTINUE SILVER NITRATE SOLUTION

At a meeting of 25 medical consultants to the National Society for the Prevention of Blindness, held in conjunction with the recent sessions of the American Medical Association in Atlantic City, continued use of 1 per cent silver nitrate solution was recommended as the preferred prophylactic agent in preventive treatment of "babies' sore eyes" (ophthalmia neonatorum). This disease formerly caused more than one-fourth of all blindness among American children.

There has been considerable research in the last few years on the use of penicillin rather than silver nitrate for this purpose. However, according to Dr. Franklin M. Foote, executive director of the National Society, the medical advisory group felt that additional scientific research is needed before penicillin can be accepted as a safe and adequate substitute.

A NEW RESEARCH FOUNDATION

The Research Foundation of the State University of New York has been organized as a private educational corporation associated with the university to develop a greatly expanded research program. It is in part a mechanism for channeling into the university private funds for research. The State University has two schools of medicine, one in New York City and another in Syracuse. It has 18 other professional colleges, as well as two liberal arts colleges and 11 two year technical institutes.

DOCTORS' COMMITTEE ON HOOVER REPORT

The Citizen's Committee for the Hoover Report has formed a nation-wide Committee of Doctors to support the recommendations of the committee in the field of health. Its chairman is Robert Collier Page, M.D., general medical director of Standard Oil Company of New Jersey. He is forming his committee of both general practitioners and specialists, numbering several thousand drawn from all parts of the country. An advisory board of doctors, representing 20 major divisions of medicine and surgery, to consult with the national chairman on matters of policy, has been appointed. Preventive medicine and public health are represented by Brigadier General James Stevens Simmons, director of the Harvard School of Public Health.

The two announced major objectives of the new committee are:

a. The conservation and fullest use of the nation's supply of doctors, nurses, and technicians.
b. The coördination of federal hospital facilities through a federal department of health, as recommended by the Hoover Commission.

PHYSICAL MEDICINE COMMITTEE ENDS

The Baruch Committee on Physical Medicine and Rehabilitation has discontinued its activities because, according to its chairman, Dr. Frank H. Krusen, it has achieved its goals. This Committee was formed in 1943 by Bernard M. Baruch to develop the diagnosis and treatment of disease by physical agents and the rehabilitation of the disabled. Mr. Baruch in memory of his physician father, Simon Baruch, provided more than $2,000,000 to carry on this work. One of the final acts of the Committee was a grant to help in the organization of an International Congress of Physical Medicine, which was held in London in July.

In the 8 years of the Committee's existence, the percentage of the nation's medical schools offering instruction in physical medicine and rehabilitation increased from 42 to 67 per cent of the total, with another 20 per cent planning to do so. Medical centers providing residencies in physical medicine in-

creased from 3 to 40. The American Medical Association has established a permanent Section on Physical Medicine and Rehabilitation, and the Advisory Board on Medical Specialties has established a specialty board in this field, thus making it the 16th medical specialty to be recognized.

The Committee's program has included:

1. Publication of five major reports concerning the modern developments in physical medicine and rehabilitation.
2. Provision of fellowships to train 48 physicians as specialists in this branch of medicine.
3. Establishment of three major centers of physical medicine and rehabilitation at the medical schools of Columbia University, New York University, and the Medical College of Virginia.
4. Establishment of special projects in teaching and research at various medical schools throughout the United States.
5. Publication of over 250 scientific articles on physical medicine and rehabilitation.

Mr. Baruch has asked the members of the Committee for their judgment on the institutions to which grants were recommended because he hopes to make "further grants to those who undertake the work with enthusiasm and beneficial results."

ORAL CANCER COURSES FOR DENTISTS

For the past two years, the New Jersey State Department of Health and the State Dental Society have coöperated in providing a series of nine courses in oral cancer. Through these courses, by the end of June, 1951, a total of 174 New Jersey practising dentists had been trained in oral cancer, particularly its public health aspects, in order that they might serve as focal points in the state campaign for the early detection and treatment of oral malignancy.

These five day, full-time courses have been given at various schools of dentistry —New York University, University of Pennsylvania, and Columbia University, among others. Tuition was paid by the New Jersey Health Department, and trainees were selected by local dental societies. Overall supervision was provided by Neal W. Chilton, D.D.S., of the State Health Department's Division of Dental Health. Similar courses will be given in the autumn of 1951.

ACADEMIES OF PUBLIC HEALTH

Academies of Preventive Medicine and Public Health have been organized in two states by the diplomates of the American Board of Preventive Medicine and Public Health in the respective states—North Carolina and Florida. Each has described its purpose in practically identical terms; "... to encourage the study, improve the practice, and advance the cause of preventive medicine and public health."

The president of the North Carolina Academy, which was organized in March, 1951, is Edward T. McGavran, M.D., dean of the University of North Carolina School of Public Health. The Florida Academy was organized in June and elected to the presidency George A. Dame, M.D., director of the Bureau of Local Health Services, State Department of Health.

PAPANICOLAOU CYTOLOGY COURSES AT CORNELL

Cornell University Medical College, New York City, offers two courses in exfoliative cytology (cancer detection) open to a limited number of physicians and technicians—the first, September 17–December 14, 1951, and the second, March 3–May 29, 1952. The courses will cover the cytology of the female genital, gastrointestinal, respiratory, and urinary tracts, as well as exudates. Arrangements for shorter periods of instruction may also be made. The instruction will be given by Dr. George N. Papanicolaou, Dr. John F. Seybolt, and their associates.

Further information from Dr. Seybolt at the Medical College, 1300 York Avenue, New York 21.

1950 BORDEN AWARDS

Winners of nine Borden Awards administered by eight different scientific societies were announced late in 1950 for that year. Gerty T. Cori, M.D., was cited by the Association of Medical Colleges for her fundamental, original contributions to the understanding of carbohydrate metabolism. She and her husband, Carl Cori, M.D., were joint recipients of the 1947 Nobel Prize in Medicine and Physiology, while Dr. Carl Cori was one of the first Lasker Award winners of the American Public Health Association, in 1946.

The winner of the 1950 Borden Award of the Home Economics Association went to Margaret A. Ohlson, head of the Department of Foods and Nutrition, Michigan State College, for her fundamental studies on the nutritional status of women. She is a member of A.P.H.A.

Other 1950 Borden Awards of particular interest to public health were:

Henry C. Sherman, Sc.D., Mitchell Professor Emeritus of Chemistry, Columbia University; American Institute of Nutrition citation for "his more than 40 years of continuous contributions to the science of nutrition."

Joseph A. Warkany, M.D., associate professor of pediatrics, University of Cincinnati Medical School; American Academy of Pediatrics citation for researches on the influence of dietary privation of the mother on the causation of congenital deformities in the fetus.

BALTIMORE'S NEW HOUSING BUREAU

An ordinance passed by the City Council of Baltimore in February, 1951, establishes a new Housing Bureau in the City Department of Health. This centralizes in a single office responsibility for assisting the several city departments involved in housing law enforcement in establishing policies, procedures, and techniques which will assure uniform enforcement, avoid duplication, and integrate activities with those of the city's Housing Authority and the Redevelopment Commission.

The ordinance provides for a director and assistant director with direct responsibility to the health commissioner. It grew out of the recommendations of "The Baltimore Plan," for combating residential blight by vigorous housing law enforcement. The ordinance provides for an advisory council of nine or more to be appointed by the Mayor.

G. Yates Cook, former director of the Office of Housing and Law Enforcement in the Health Department, has been made the director of the new Housing Bureau. He has been on the Health Department staff for 10 years. The *Baltimore Health News* says, "Out of his constant and unceasing application has come the so-called 'Baltimore Plan,' a method of housing rehabilitation which has received attention throughout the nation."

MICHIGAN UNDERTAKES GOITER SURVEY

The Michigan State Health Department is conducting a survey of endemic goiter in 4 counties of the state—Macomb, Midland, Houghton, and Wexford. Examinations will be given to 70,000 school children from kindergarten through high school with the cooperation of local physicians and local health departments. Coöperating with the department are the Iodized Salt Committee of the State Medical Society and the Nutrition Advisory Committee to the State Health Commissioner.

When these counties were first surveyed for endemic goiter in 1924, about half of the children examined were found to have the disease. As a result, salt manufacturers put iodized salt on the market in Michigan, which lies in the "goiter belt" of the United States.

INDIANAPOLIS-MARION COUNTY UNION

An Act of the 1951 Indiana Legislature creates the Health and Hospital Corporation of Marion County by com-

bining the Indianapolis and Marion County Health Departments. Becoming effective July 1, 1952, it provides for a Board of Trustees of 5 members to be appointed by the Mayor and by the County Commissioners. This represents one of the few instances in which a single administrative jurisdiction has been created for the health services of a county and its contained city. Atlanta and De Kalb County were similarly united by the 1951 Georgia Legislature. The 1949 North Carolina Legislature consolidated the health services of Guilford County, Greensboro, and High Point, each of which at the time were organized for full-time health services.

PERSONALS

JAMES WHITMAN AGNA, M.D., and DAVID HYMAN FELDMAN, M.D., Public Health Service officers, have joined the Specialized Technical and Economic Mission in Burma, administered by the Economic Coöperation Administration, with headquarters in Rangoon. They are expected to remain for 2 years.

A. W. ANDREASEN, M.D., Dr.P.H.,† formerly health officer in Muhlenberg County (Ky.), is now health officer of Union and Webster Counties in the same state.

JOSEPH C. AUB, M.D.,* director of the Collis P. Huntington Memorial Laboratories, Boston, and professor of research medicine at Harvard Medical School, has received the 1951 Medal of the American Cancer Society for "distinguished service in cancer control."

PHYLLIS F. BARTELME, Ph.D., formerly research consultant for the Institute of Welfare Research of the Community Service Society in New York, has joined the professional staff of the National Society for Crippled Children and Adults as New York field representative and consultant in psychology.

WALTER BAUER, M.D., has been appointed Jackson professor of clinical medicine at Harvard Medical School and chief of medical services at Massachusetts General Hospital. He was previously associate professor of medicine at Harvard and physician at the hospital. He is the eighth physician to hold the Jackson professorship since it was established in 1854.

JACKSON P. BIRGE, M.D.,† formerly health officer of the Matagorda County Department of Health (Tex.) has been appointed health officer of the Illinois Department of Public Health's Northwest Region, with headquarters in Rock Island. This district is made up of 5 counties and provides some direct as well as consultant services.

FRANCIS G. BLAKE, M.D., Sterling professor of medicine at Yale University School of Medicine, has been appointed scientific director, Medical Research and Development Board, Office of the Army Surgeon General.

MAJOR GENERAL R. W. BLISS, Surgeon General of the U. S. Army, on the occasion of his retirement was presented a testimonial by Secretary of the Army FRANK PACE, at ceremonies on May 31, honoring his 40 years of Army Medical Service. He has been succeeded by MAJOR GENERAL GEORGE E. ARMSTRONG, Deputy Surgeon General.

LEVERETT D. BRISTOL, M.D.,* has resigned as chief of the Pennsylvania Health Department's Division of Cancer Control, due to ill health.

JOHN H. BROWE, M.D.,* has been appointed director of the Nutrition Bureau, New York State Department of Health, with the rank of principal public health physician.

W. A. BROWNE, M.D., M.P.H.,* formerly health officer of the Evansville, Indiana, City-County Health Department, recently became director of Edgecombe County Health Department, Tarboro, N. C.

MERLE BUNDY, M.D.,† formerly director, Tuberculosis Control Division, Indiana State Board of Health, is now director of the Pittsburgh Tuberculosis Control Program, functioning as coördinator of tuberculosis control activities for the City Department of Health.

HELEN L. BURKE* completed 25 years as executive secretary of the Colorado Tuberculosis Association, Denver, in June and has retired from the staff.

CLAIR H. CALHOON, Ph.D., formerly chief psychologist, Mental Hygiene Division, Ohio Department of Public Welfare, is now mental health consultant in clinical psychology of the National Institute of Mental Health, U. S. Public Health Service, assigned to the Atlanta Regional Office.

MARCOLINO GOMES CANDAU, M.D.,† former director of the WHO Division of Organization of Public Health Services, has succeeded Martha M. Eliot, M.D., as WHO's assistant director general, in charge of advisory services, in the Geneva office. Before joining

* Fellow.
† Member.

WHO, Dr. Candau was superintendent of the "Servico Especial de Saude Publica" (S.E.S.P.), a coöperative public health program of the Brazilian Government and the Institute of Inter-American Affairs.

LOWELL T. COGGESHALL, M.D.,* chairman, Department of Medicine, University of Chicago, has been appointed chairman of the Medical Committee, Research and Development Board of the Department of Defense, Washington, D. C.

MORRIS M. COHN,* public health engineer of Schenectady, N. Y., was elected chairman of the New England Interstate Water Pollution Control Commission at its annual meeting on June 8.

CHARLES W. CRAWFORD has succeeded PAUL B. DUNBAR, retired, as U. S. Commissioner of Food and Drugs. Dr. Dunbar started as a Food and Drug Administration chemist 34 years ago.

EDGAR D. DAVIS, director of Region 2, which includes Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee and Virginia, has been made an assistant to the president of the National Foundation for Infantile Paralysis. He has been succeeded in Region 2 by WILMER SIMS, formerly northwestern Texas state representative.

VIVIAN V. DRENCKHAHN, M.P.H.,* director of health education, National Tuberculosis Association, is in Europe on a 2 month special assignment for WHO. She will be in Yugoslavia and Finland to help in the planning of health education programs and will also attend health sessions at Soissons, France, and Winchester, England.

EDGAR J. EASLEY, M.D.,* director of the Venereal Disease Control Division, has been appointed assistant state health officer of Arkansas and director of the Bureau of Local Health Services, succeeding J. T. HERRON, M.D.,* who was made state health officer.

EDWARD E. ELLIS, who has just received a master's degree from the University of Louisville's Kent School of Social Work, has been appointed psychiatric social worker in the Kentucky State Department of Health to serve Franklin and surrounding counties.

MRS. LOUIS FALLON, R.N., is now general public health nursing consultant, Arizona State Health Department.

OSCAR FELSENFELD, M.D.,* director of bacteriology of the Hektoen Institute, Chicago, upon recommendation of the University of Malaya, has received the Fulbright Award from the State Department to carry out an enteric survey in Malaya and to teach bacteriology and public health in the University of Malaya in Singapore.

JOHN FIELD, M.D., for the past 2 years head of the Biology Branch of the Office of Naval Research, while on leave of absence as chairman of the Department of Physiology of the University of California Medical School at Los Angeles, has been named to head the National Science Foundation's Division of Biological Sciences, with headquarters in Washington, D. C.

L. WHITTINGTON GORHAM, M.D.,† chairman of the Public Health Council of New York State, has been appointed director of the Public Health Research Institute of the City of New York, succeeding WALTER W. PALMER, M.D., deceased.

S. I. GRIBOFF, M.D., serving his interneship at New York City's Mt. Sinai Hospital, has been announced as the winner of the 1950 Schering Award of $1,000 for his work on the paper, "The Clinical Use of Steroid Hormones in Cancer." Two co-authors, ROBERT W. WINTERS and HENRY M. WILLIAMS, third year students at the Yale University School of Medicine, received second prizes of $500 each.

MARGUERITE GROOVER, dental hygienist, formerly in the Lawrence-Wabash County Health Department, has been employed by the Effingham (Ill.) County Board of Health to start a public health dentistry program in that county.

JANET B. HARDY, M.D., formerly on the staff of the Harriet Lane Home of the Johns Hopkins Hospital, is now director of the Bureau of Child Hygiene, Baltimore City Health Department, succeeding M.. ALEXANDER NOVEY, deceased.

JOSEPH HIRSH, Ed.D.,* currently with the National Research Council and the Medical Advisory Board of the Hebrew University-Hadassah Medical School, has been promoted to Lt. Col., MSC-USAR, and on reserve status has also been appointed director of the Medical Service Branch, ORC School, First Army Area.

IRA V. HISCOCK, Sc.D.,* chairman of public health, Yale University, and since 1928 a member of the New Haven Board of Health Commissioners, has been appointed to the Public Health Council of Connecticut for a 5 year term.

R. O. INGHAM, M.D.,* has resigned as health officer of Santa Cruz County (Calif.).

LOUIS N. KATZ, M.D., of Michael Reese Hospital, Chicago, was elected president of the American Heart Association, succeeding

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* Fellow.
† Member.

HOWARD B. SPRAGUE, M.D. IRVING S. WRIGHT, M.D., of the Cornell University Medical School, was chosen president-elect.

PEARL KENDRICK, ScD.,* has been granted leave of absence from the Michigan Department of Health, where she is associate director of the Division of Laboratories, to become a resident lecturer in the School of Public Health, University of Michigan.

GEORGE P. LARRICK, associate commissioner since 1945, has been appointed deputy commissioner of food and drugs, Federal Security Agency, Washington, D. C., succeeding CHARLES W. CRAWFORD, who was recently made commissioner.

ALFRED H. LAWTON, M.D., Ph.D.,† formerly research chief, Research and Education Service, Veterans Administration Department of Medicine and Surgery and assistant professor of clinical medicine, George Washington University School of Medicine, is now research director for the U. S. Air Force Medical Service.

ROBERT T. LEGGE, M.D., professor of hygiene emeritus, University of California School of Public Health, received the William S. Knudsen Award for outstanding contributions to industrial medicine at the 36th Annual Meeting of the American Association of Industrial Physicians and Surgeons held at Atlantic City in April.

MORTON L. LEVIN, M.D.,* who has been director of the Commission on Chronic Illness program on a leave of absence from the New York State Department of Health, has been recalled to his position as assistant commissioner for medical services.

PERRIN H. LONG, M.D., professor of preventive medicine, Johns Hopkins University School of Medicine, Baltimore, has been appointed professor of medicine and head of the department at the University of the State of New York Medical Center in Brooklyn, N. Y., formerly the Long Island College of Medicine.

VICTOR LORBER, M.D., associate professor of biochemistry at Western Reserve University is the first Career Investigator to be appointed by the American Heart Association, itself the first voluntary agency to undertake a program providing for continuing careers of scientific research investigators of proved ability and originality. Dr. Lorber will conduct research relating to disorders of the heart and blood vessels.

ESTHER POHL LOVEJOY, M.D., of New York, is the recipient of the 1951 Elizabeth Blackwell Medal, given annually by the American Medical Women's Association for "outstanding contribution to the advancement of women in medicine."

CARL M. NOVICK, M.A., formerly health educator with the Department of Health and teacher in the New York City Board of Education, has been appointed health educator, Health Insurance Plan of Greater New York, New York City.

MAJOR ALEXANDER S. O'HARA,† currently regional consultant in sanitation with the Ontario Department of Health, was recently awarded the Canadian Forces Decoration for long and meritorious Army service.

GEORGE H. PARKER, formerly sanitarian with the Butler-Greenwood Counties Health Department in Kansas, is now sanitarian, Navajo County, Ariz.

JOHN O. RAFFETY, M.D.,† has been appointed health officer for Yolo County (Calif.), which has not had a full-time health officer since 1943. Dr. Raffety was health officer of Yolo County from 1938 to 1940, and has since filled similar posts in Sonoma and Santa Cruz Counties.

L. W. ROWLES, D.V.M.,* formerly with the Topeka City-County (Kans.) Health Department, is now veterinarian with the U. S. Public Health Service, assigned to the Division of Preventive Medicine, Kentucky State Health Department, to make a study of the serious rabies problem in the state and to work with the Division of Foods, Drugs and Hotels on the sanitation and inspection of slaughterhouses and poultry-killing establishments.

COL. MYRON P. RUDOLPH, M.C., USA (Rtd.),* is now health director, Catawba-Lincoln-Alexander District Health Department in North Carolina, with headquarters in Newton. He has also recently been appointed a consultant to the Health and Special Weapons Division, Federal Civil Defense Administration, Washington, D. C.

BRIG. GEN. CRAWFORD F. SAMS,† who has been on 6 years' duty as chief of public health welfare at the Allied Powers Headquarters in Tokyo, was recently awarded the Distinguished Service Cross for extraordinary heroism in a daring foray behind enemy lines in Korea to gain medical information for the protection of United Nations troops.

EMANUEL B. SCHOENBACH, M.D.,* associate professor of preventive medicine, assistant professor of medicine, and physician at the Johns Hopkins Hospital, Baltimore, has resigned to become professor of medicine at the State University of New York College of Medicine, and director of the medical services, Maimonides Hospital, Brooklyn, N. Y.

GERALD W. SCHRODER, health publications editor and chief of the publications section of the Office of Public Health Education, New York State Health Department since 1948, has accepted a position with the McGraw-Hill Publishing Company, New York City.

GORDON H. SEGER, Dr.PH.,* who has been project review officer for the National Institutes of Health extramural research program, has been appointed executive officer of the National Cancer Institute at Bethesda, Md., serving as executive assistant to the director of the Institute, JOHN R. HELLER, M.D.†

ROY M. SEIDEMAN, M.D., Dr.P.H.,* recently with the Bureau of Industrial Hygiene, Connecticut State Health Department, has been appointed to the Office of the Surgeon General, U. S. Air Force, assigned to the Preventive Medicine Division.

THOMAS E. SHAFFER, M.D.,* of the Department of Pediatrics, Ohio State University, Columbus, has resigned to become identified with the Department of Pediatrics at Temple University School of Medicine, Philadelphia, where he will be a member of the staff at St. Christopher's Hospital for Children.

THOMAS B. SPENCER, M.D., for the past year deputy executive director, has been appointed executive director of the Committee on Medical Sciences, Research and Development Board, Department of Defense, Washington, D. C., succeeding JOSEPH M. PISANI, M.D., who has become assistant dean and instructor in medicine of the State University Medical Center at New York City.

RUTH SPURRIER, R.N., field advisory nurse, Kentucky State Health Department, who has been on educational leave, has returned after earning her master's degree in public health at the University of Michigan.

LANSING S. THORNE, M.D., has become pediatric consultant to the Alaska Department of Health staff and will be in charge of the Chronic Disease Unit at St. Ann's hospital. He succeeds VIRGINIA COBB, M.D., who has returned to private pediatric practice in Tucson, Ariz.

CARL A. WALDEMAYER, M.D., formerly in private practice in the state, has been named health officer for the Knox-Laurel County Health Department, Ky.

WILLIAM R. WILLARD, M.D.,* formerly professor of public health and assistant dean in charge of post-graduate medical education, Yale University School of Medicine, has been appointed dean of State University College of Medicine, Syracuse, N. Y.

FRANK P. WITKO, formerly production director, Nolan and Twichell Advertising Agency, Albany, has been appointed publications production assistant, Office of Public Health Education, New York State Department of Health.

* Fellow.
† Member.

DEATHS

CHRISTOPHER L. DEVITT,† of Jersey City, N. J. (Unaffiliated).

HARRY B. FRANCHERE, M.D.,† of Albany, N. Y., on January 12, 1951 (Health Officers Section).

ROBERT B. GRIFFIN, M.D.,† of Ripley, Tenn., on April 12, 1950 (Health Officers Section).

CORNELIUS A. HARPER, M.D., Wisconsin's state health officer for 47 years before his retirement in 1943, died June 26 at the age of 87.

F. D. MCMAHON,† Arizona State Veterinarian, on November 22, 1950 (Unaffiliated).

WILLIAM B. PALMER,* for 35 years executive officer of the Milk Inspection Association of Oranges and Maplewood with headquarters in Orange, N. J., on May 25. He was a life member of the A.P.H.A. (Food and Nutrition Section).

PHILLIP S. RANDOLPH, executive director of the North Carolina League for Crippled Children, on April 30 in the Veterans Hospital in Fayetteville, at the age of 55.

LONSDALE J. ROPER, M.D.,* director of health Virginia State Health Department, on June 12 at the age of 65, of a heart ailment (Health Officers Section).

RUELL SLOAN, M.D., pathologist and curator of the Army Medical Museum, Washington, D. C., on June 17, of a heart attack at the age of 42.

HARRY P. WAREHAM, executive vice-president of the American Hearing Society since 1946, on June 11, at the age of 68, following a heart attack.

CONFERENCES AND DATES

American Public Health Association. Headquarters, Civic Auditorium, San Francisco, Calif. Oct. 29–Nov. 2.

Western Branch (18th Annual Meeting) with the A.P.H.A. Civic Auditorium, San Francisco, Calif. Oct. 29–Nov. 2.

Coming in August, September, and October:

American Congress of Physical Medicine. Shirley-Savoy Hotel, Denver, Colo. Sept. 4–8.

American Dietetic Association. Cleveland, Ohio. Oct. 9–12.

American Hospital Association. St. Louis, Mo. Sept. 17–20.

American Occupational Therapy Association. New Castle, N. H. Sept. 8–15.

American Pharmaceutical Association. Buffalo, N. Y. Aug. 26–31.